

Shared Living Environments: Needs, Patterns, and a Design Example

by
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Shared Living Environments:
Needs, Patterns, and a Design Example

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Carol Jean Boemer

Submitted to the Department of Architecture on January 14, 1982, in partial fulfillment of the requirements for the degree of Master of Architecture.

Abstract

Shared living is becoming a viable alternative lifestyle yet many residential buildings cannot be easily adapted to support this communal way of life.

Aspects of communal living are investigated for the purpose of determining the benefits and conflicts inherent in shared living situations. An investigation is also made of the intensified needs of such groups for control over their built environments.

Means for encouraging this control include allowing multiple interpretations of spaces by providing a choice of activity settings and "designing in" flexibility that would allow groups of users to change their environments according to perceptions of appropriate degrees of both privacy and sharing.

Guidelines and design standards outlining spatial relationships, circulation possibilities, utility locations, etc., are suggested as an aid to designers making buildings which can anticipate change. Some devices such as moveable partitions, "pull-down" stairs, rearrangeable storage units, etc., are also described as aids to inhabitants when taking part in the continually changing process which is dwelling.

Three case studies of actual congregate living groups are presented and used as prototypes for a design study. The design attempts to illustrate the adaptation and interpretation possibilities afforded when the aforementioned guidelines, patterns, and devices are implemented. Three inhabitations, each based on one of the case studies, are presented as a test of the adaptability of the design. A "footprint" for individual private territory design is also developed.

Thesis Supervisor: N. John Habraken
Title: Professor of Architecture

Prologue

To make a city
you need the parts of people -
their beauty, their hands,
their vision good or bad,
their pull-together
push-together nature
when the work is hardest.

So much heartache
 so much joy
 so much love
saws a plank
nails down a board
sets a brick in place
pours a sidewalk
stitches up a siding
frames a pane of glass.

We build together
skyward from the ground.
Each of us a brick,
a chink, a shingle, or a board -
nothing more than one small part
of that ongoing main.

We build better
all the time.
We learn the trade
of builders
 and of architects
from necessity
and more from observation.

We connect with masonry
and not Scotch Tape;
the nail straightly driven
will again replace the staple.

Rod McKuen

Acknowledgements

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Finally, I wish to dedicate this work to Eric Hulteen, for without his unwavering support, encouragement, and insistence that I do this myself (regardless of how I "feel" about things), this thesis would never have been realized.

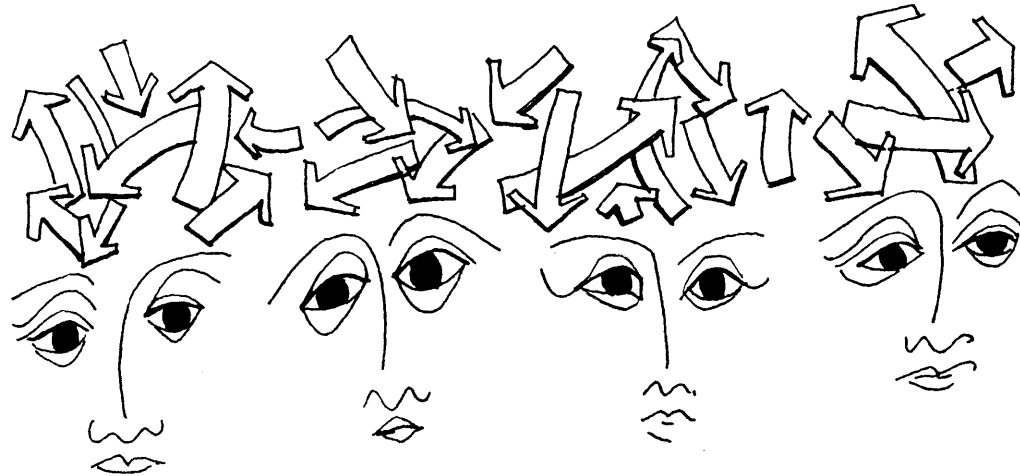


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Introduction

With the realization that issues inspiring concern and subsequent study also evoke images, causes, and solutions which are sometimes subjective in nature, this work relies heavily upon the experiences and personal philosophy of the author throughout the process and in the product. Some of the personal convictions which have inspired this study are enumerated below.

1. Designers of housing directly effect the quality of people's lives. They should, therefore, use this opportunity to make more "humane" environments.

2. Humans cannot attain fulfillment in life in isolation. Cooperation with others is a beneficial condition, both socially and economically.
3. People are always seeking to determine their own place in the world. It is the act of "dwelling" or inhabitation that gives buildings "character".
4. Current building technology affords the opportunity for people to modify and adapt their built environments. If properly implemented, this technology can

reduce the amount of lifestyle adaptation required by buildings.

It is also the author's convictions that have influenced the inclusive nature of the approach to this work. It is assumed that there should be no distinction between general standards of good design and the standards required by shared living situations. While discussion of the specific requirements of shared living is the goal of this work, many of the ideas presented apply to all residential environments, regardless of social structuring of the members of the inhabiting household. The designer of a single-family residence then could also benefit from the abstractions herein presented which deal with the public/private issues and the

methods for increasing adaptive possibilities.

The Problem

Control of Environment

To a greater extent than perhaps any nation, we Americans have become an "indoor people". A large portion of our lives — working, sleeping, playing — is spent in buildings: buildings over whose design and construction we have little or no control; buildings whose physical and economic distribution are only remotely conditioned by our needs; buildings whose effect upon our health and happiness is only obscurely understood.

J. M. Fitch

When we realize how much of our lives is spent inside buildings and how much influence the built environment has on our lives, we can see why a sense of control over buildings, especially one's own dwelling, is essential to general health and happiness. Occupants confronted with living environments that are so totally designed as to inhibit even reasonable modification to individual users' lifestyles are soon outmoded and abandoned (if at all possible) in favor of more tolerant designs. Control over one's environment is an important ingredient of user satisfaction and should be an important factor in design of

residences.

Of course, some people will accommodate themselves to any environment no matter how uncomfortable, either because they do not have the knowledge or resources to improve the situation or because they believe that rules forbid them to alter the arrangement. Some institutional and financial structures require the limitation of individual control but more often than not the cause of user frustration can be traced to ignorance of the opportunities for intervention and to architectural over-definition.

People who do attempt to change their dwellings are often willing to live with mistakes they make in manipu-

lating their own housing because it is a means of learning about the opportunities of that housing. In exercising some control, they learn that mistakes can always be modified at a future date. This knowledge alone is important for establishing a sense of "ownership" and a sense of "caring" for one's environment..

A group of M.I.T. students and research faculty discussed "control" and its relationship to "caring" in a paper entitled "Powers of Inhabitation." One of the "powers" that they observed is for people to be able to "invest care" and to be able to express their presence in a place and to modify it to suit their needs and desires.*

This type of caring is .

what makes a house seem like a home. A sense of control is what must be developed if architecture is to promote a more humane, harmonious society.

However far the designer goes, it is the occupants who go on to put the finishing touches to a building, once they have taken it over, constantly changing and renewing it, and constantly taking more complete possession of it. They interpret the building in their own way, and the more diverse the ways in which the building allows for completion, the more people there will be who can feel at home in it.

*Herman
Hertzberger*

**Donlyn Lyndon and others, "Powers of Inhabitation: Observations in the Via Monserrato", 1977 Grunsfeld Rome Report, M.I.T. Dept. of Architecture, 7.*

Participation

The ability for participation in and interaction with one's environment is primary to a sense of control over one's surroundings. The industrialization and standardization of building materials and house construction has led many people to believe that their participation in the built environment is not encouraged and almost prevented. Change is really inhibited due to the trade-off of lower costs brought about through durable, mass-produced building materials.

People a hundred years ago, on the other hand, were much given to change. They cut houses in half, put houses together, and moved houses and barns across town. They

skidded houses down frozen rivers - even floated houses out to sea on barges.* Their sense of ownership and associated control over the residential environment deemed houses to be an important resource.

Today, however, very few people really step back from where they work or where they live and say, "Is this functioning the best that it possibly can for me?" or "How can I make this place better without making drastic changes?". Even the ability to question and fantasize about change is inhibited. Most people seem to give the prerogative for shaping the built environment to professionals (i.e. architects, en-

**Charles Wing, From the Walls In, 61.*

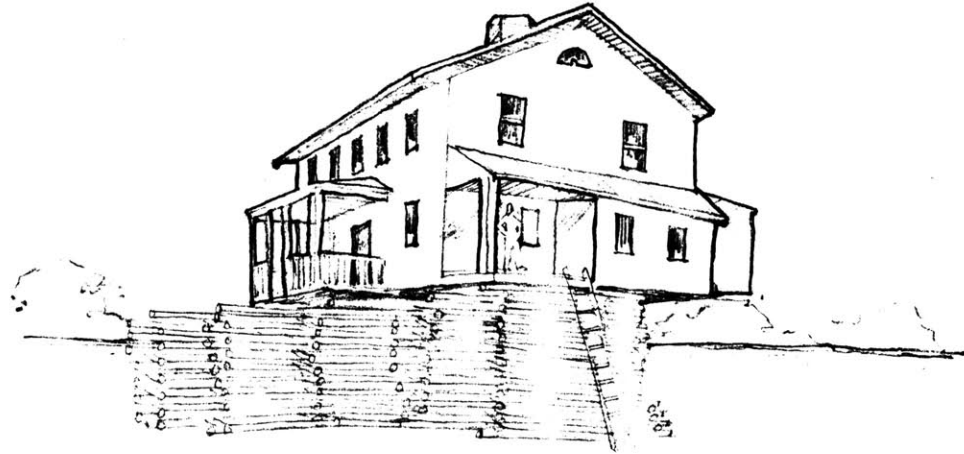
All people are builders, creators, molders, and shapers of the environment; we are the environment.

Robert Sommer

gineers, and builders).

But design, in the sense of creating images through manipulation of space, materials, and objects, is not the sole prerogative of experts such as architects. Even the design professions are realizing this and attempting to initiate cooperative, participatory design processes through which users may shape their environments. Most people are designers in the sense that they send their own environmental messages through their use, selection, and arrangement of objects, furnishings, and space.

Recognizing the important role of the user as a designer or "changer" of the environment, the problem confronting design professionals



is to propose a means that would enable inhabitants to continue to participate in the physical environment even after initial design and construction of a building. This changing, enduring life of places must not be precluded by idiosyncratic designs. Buildings, especially dwellings, should be considered "opportunity structures" which encourage user participation.

It's the users who are ultimately responsible for the environment and that is why it is important that they have an awareness of the environment and some ability to change it.

Cora Beth Abel

Reasons for Change

Because the design of most housing currently supposes a unique mode of use and expression, the potential of its occupants for variety of expression and participation may be compromised. When the mismatch is serious the dwelling is said to be obsolete. Its inability to accomodate a variety of acts of dwelling or a changing view of home life sometimes makes redevelopment or changing environments (i.e. moving) more attractive than rehabilitation.

This is sad when it happens, particularly in light of the fact that many physical changes to environments can be foreseen. There are actually a limited range of possible changes controlled by social

and cultural conventions, housing technology, and the marketing efforts of the furnishing and home improvements industries.*

While physical changes are somewhat limited and predictable, reasons for initiating changes are personal and highly varied. Some of the reasons people have stated as their reasons for making changes to their houses are outlined.

*Andrew Rabeneck and others, "The Structuring of Space in Family Housing: An Alternative to Present Design Practice", Progressive Architecture (Nov. 1974), 102.

People like spaces they can call their own and make over; they reject an alien environment that is built according to detailed square footage allocations for a standard model of impersonal humanity in the most durable and antiseptic condition. The man of tomorrow whose capacity to the environment is reduced, may be excused from this lesson, but we are not.

Robert Sommer

1.--to accomodate change
in family make-up or
activities.

People may wish to
change the number of
bedrooms or add more
storage area for the
arrival of a new
baby or in anticipa-
tion of the inclusion
of an elderly rela-
tive in the house-
hold.

2.--to improve home
"quality".

Alterations to kit-
chens and bathrooms,
purchase of new
equipment such as
washers, and addi-
tions such as car-
ports or playrooms
not only upgrade the
environment for the
residents but also

increase the poten-
tial market value of
the house.

3.--to rearrange inter-
ior subdivisions.

The possibility of
redefining room use
by opening up or
closing off spaces
such as the kitchen,
living room, or chil-
dren's play area is
seen as an impetus
for renovations to a
house.

4.--to rezone the house

Changing interior par-
titions can not only
change room function
but also redefine for-
mal and informal
areas, child/adult
realms, or noisy and
quiet zones.

5.--to be different from

(identity) or the
same as (keeping up
with the Jones')
neighbors.

People will upgrade
interior finish mate-
rials, add on more
space, and purchase
new household equip-
ment in order to be
accepted or display
a certain status.

Change to the home
is a personal means
of signalling social
acceptance or dis-
playing individual
tastes.

Of course, there are many other reasons for changing one's environment. Reasons for moving or abandoning an inconvenient environment can also shed some light on aspects that should be encouraged or re-thought in new buildings.

Peter Rossi, in his study of the reasons why Philadelphian families moved, cited amount of space as the primary criteria in the evaluation of the adequacy of a dwelling. However, the design of the house and its ability to accomodate family size and age shifts was seen to be an additional factor which influenced a family's need to move.*

**Peter Rossi, Why Families Move, 177.*

Although reasoning for changes to one's environment (be it moving or adapting the

physical place) are hard to pin down and describe, certain inadequacies are seen to be intolerable to most users. Control over one's environment encouraged by an understandable means of participation can lead to a more generally humane environment. When people have a way to act out their needs expressed in their reasons for change, they then have a motive for investing care in their environment. Such a participatory atmosphere makes houses into homes.

Group Living

Economics and Regulations

The realities of today's housing market are forcing people to re-examine their ideals and to come up with innovative social, legal, financial, and architectural solutions to their need for shelter.

As the post World War II boom of babies matures into housing "consumers", the housing stock in the U.S. is due to fall into short supply. A current trend toward a lessening vacancy rate in existing dwellings and a decreasing number of construction starts due to high interest rates on loans, points to a potential housing crisis in this country. Production of housing, hampered by inflation and economic constraints, is not keeping pace with demand.

At present, most Americans live in old dwellings. Of about eighty million housing units, only two million are new production units, never before lived in.* When also considering the natural attrition rate of housing (each year about one third of a million units are taken out of use), one can see that more new housing starts are definitely needed.

The cost of home owning has increased dramatically over the past few decades. According to the Greater Boston Real Estate Board, the average cost of a single family home in the Boston area was \$81,960 in February of 1981 (quite a leap from \$77,867 in February of 1980).

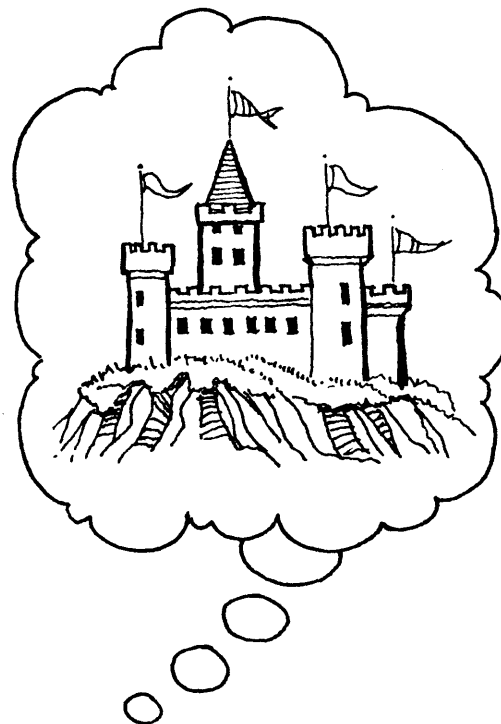
**Roger Montgomery and Daniel R. Mandelker editors, Housing in America: Problems and Perspectives, 81.*

**Stephen R. Mc Connell and Carolyn E. Usher, Intergenerational House-Sharing, 1.*

**Ibid.*

Today the national average cost is \$77,000 with regions such as Southern California reporting a median price of all homes as high as \$112,000 and rising.* The price of maintaining a house has risen dramatically too. Between 1970 and 1975 the cost of maintaining a house rose 63 percent (a rate equivalent to 10.3 percent compounded annually).*

The high costs are eliminating many people from the market for single family housing. Back in 1950, seven out of ten American families could afford the cost of a new median-priced house. That number had fallen to four in ten by 1975. Should this continue, the U.S. will become less and less a nation of homeowners, and despite de-



*Montgomery, *op. cit.*, p.121.

In the '50's, the ranch was the starter home. Today, it's the condo to build up equity, sell, and move into a single-family (house). The condo has become the ranch of the eighties.

Ken Morrison

acades of federal encouragement and massive tax subsidies, the new single-family house will become a luxury item for most.*

The attraction of the single-family home for most buyers consists of a combination of pastoral imagery, a connotation of ownership and security, a place for children to play, and the value and pleasure of land ownership. To preserve some of these values within a denser, more urban context, the concept of condominiums was developed. Condominiums offered insurance of ownership and economic profit within a more centralized (urban) environment. Today, condos make up almost 50 percent of the new housing market—a phenomenal statistic considering that as recently as 20 to 25 years ago many

states still outlawed their construction.

Condominiums are preferred by singles, childless couples, and couples with grown children. Often condos are seen as a first step toward home-ownership. They minimize the time and effort involved in maintenance and up-keep of a home by a pooling of resources. However, these advantages are offset by a lack of privacy and minimal connection with indoor space. Condominiums offer one type of ownership solution to the housing problem for some but not all potential housing "consumers."

According to projections for the 1980's, an increase in the number of households can be expected beyond the rate of expansion of the popu-

lation. The explanation can be found in the dramatic rise in the number of single person households. The once typical, nuclear family consisting of a working father, house-keeping mother, and 2.5 children no longer holds the huge share of the market that it once did. A survey by the U.S. League of Savings Associations showed that single people made up more than one fifth of all homebuyers in 1979.

Not only are single-person households on the rise but also there is beginning to be an increase in the number of housing units shared by independent (non-family-related) persons as evidenced by the multitude of "apartments-to-share" ads in most urban and suburban

newspapers. Young working persons and students, for reasons of economy or convenience, find it desirable to share housing with others in similar situations. Lured to houses for the same reasons as married couples - tax advantages and investment potential - single people are tired of paying high rent with no return, real estate agents say. Also attitudes are changing. People no longer feel that they have to be married or part of a "blood related family" to enjoy the comforts of a home.

Zoning regulations and ordinances today are restricting some of the options for this type of shared living. The most restrictive areas designated as "single-family" or R1 areas in most munici-

About one third of the loans we provide are to single borrowers in groups of two or more.

*Richard Lawton
(president, National
Savings and Loan
League)*

palities allow no unrelated individuals to reside in a single-family dwelling. However, most jurisdictions allow homeowners to rent out rooms to unrelated individuals (an average of 3.4 unrelated individuals in addition to the homeowner are permitted per single-family dwelling). The regulations are aimed at protecting neighborhoods from increasing in density. Most jurisdictions prohibit boardinghouses, for instance. If all persons, related or unrelated, live as a single housekeeping unit, it is considered a "family" and not a boardinghouse—if, on the other hand, all members do not have equal access to kitchen, bathroom, and living facilities, it is generally considered a boardinghouse.*

The definitions are vague enough to allow for some variety of household composition and various degrees of sharing.

Another hindrance to shared living can be seen in the regulations attached to supplemental security income (SSI) for the elderly and the food stamps program. Both of these programs favor families and independent households.* Often the economics supported by these types of programs will force people to live alone instead of pooling resources and living in independent group residences (IGR's) set up under HUD Section 8 subsidies to help the elderly and handicapped remain "connected" to society and defray living expenses.

Yet, despite the absence

**McConnell, op. cit.*, p.36.

**Ibid.*, p.34.

of regulatory incentives, people are finding many advantages to a shared lifestyle as compared with rental or condominium ownership. As the economy makes much of today's housing out of reach for many people, new social and ultimately new regulatory models will develop and more options will become viable solutions to the problem of housing in the United States.

Types of Groups

At present, it seems that we as a culture are moving out of the age of the nuclear family and into a new society marked by diversity in family life. Alvin Toffler, author of Future Shock, in his new book The Third Wave, divides history into three major "waves" or stages of cultural development. The industrial revolution and the subsequent development of cities brought the world out of the First Wave of rural, agricultural, peasant life. According to Toffler, we are currently at the transition between the manufacturing, centralized, Second Wave and the future Third Wave which will be a culture based on information

transfer, participation rather than representation, and services rather than physical production. In terms of the family, the First Wave was characterized by the large, multi-generational, "extended family" with many members (workers) and a firm rooting to the land. The Second Wave is typified by the "nuclear family" - independent for mobility and small for economy.

Although the ideal family form for the Third Wave is hard to predict at present, we can clearly see that families and lifestyles are changing. If we look at how many people today live in the typical nuclear family (defined as a working father, housekeeping mother and two

**Alvin Toffler, The Third Wave, 211.*

**William Michelson, "Stage in the Life Cycle and Urban Environment" in Man and His Urban Environment: A Sociological Approach, 97.*

children), the answer is an astonishing seven percent.* That implies that ninety-three percent of Americans do not fit the Second Wave ideal! Even if we broaden the definition of a "nuclear family" to include households with fewer or more than two children and working mothers, still approximately two-thirds to three-quarters of the U.S. population live outside the nuclear family. It has also been pointed out by sociologist and author William Michelson that no less than thirty years of one's life span is spent outside of the nuclear family situation.*

Today we are witnessing an abundance of alternative living styles and groupings of individuals including com-

munes, commuting marriages, family clusters, and groups of elderly people banding together to share expenses. However, these are still not the norm and are viewed as experimental. Our society is still geared for encouragement of the Second Wave nuclear family. According to Toffler: "In economic and social life, individuals cannot enjoy the benefits of widened family options so long as laws, tax codes, welfare practices, school arrangements, housing codes, and even architectural forms all remain implicitly biased toward the Second Wave family. They take little account of the special needs of women who work, of men who stay home to take care of their children, of bachelors and "spinsters" (hateful

**Toffler, op. cit.*, p.224.

**Ibid.*, p.212.

term!)), or of "between-marrieds", or "aggregate families", or widows living together. All such groupings have been subtly or openly discriminated against in Second Wave societies.*

But "the times they are a-changin'", and the pressures of economics (outlined in the previous section) and recent social and moral transformations are pushing people to explore some alternatives to the "all inclusive" family lifestyle. For instance, there has been a dramatic increase in the number of "solos"--people who live alone outside of any family whatsoever. Today one fifth of all households in the U.S. are categorized as "solo households".* This group includes not only formerly married

people who live alone between marriages but also a large class of young people who are leaving home at an earlier age and marrying later. This phenomena of a transitional living phase is becoming an acceptable part of one's life cycle, says specialist Arthur Norton. The housing producers have responded to this new user group by providing "singles only" condominiums and increasing the number of "small" and "studio" apartments being constructed.

Another lifestyle that is on the rise is people living together without legal formalities. Their number has more than doubled over the last decade. So common is this lifestyle that now unmarried couples are permitted by HUD to occupy public hous-

**Ibid.*

ing units.*

The "couple" as opposed to the "family" is beginning to be an important factor in the housing market. There is presently a growth in the number of those couples choosing a "child-free" lifestyle. James Ramey of the Center for Policy Research notes a "massive shift from 'child-centered' to 'adult-centered' homes." There are even organizations such as the National Alliance for Optional Parenthood which are trying to validate this option for couples today.

Perhaps the most publicized and spectacularly increasing new lifestyle is the single-parent family. Today, one in seven American children are raised by a single parent and that number increases to one in four in urban areas.*

**Ibid.*

**Ibid.*

The high rate of divorce today is, of course, the cause of many of these "mini-families." However, divorced parents are also finding it economically advantageous to combine resources and are thereby creating a new family style—the "aggregate family." When two divorced parents marry and bring the children of both former marriages into a new expanded family form, problems of sharing, privacy, and space are created that the typical single family house is often unequipped to solve. It is estimated that twenty-five percent of American are or soon will be members of such households.*

As another solution to the problems of rising inflation, the lack of appropriate housing, and responsibilities of

single parenthood many young adults are choosing to return to their old homesteads. Parents are refurbishing basements, garages, and spare bedrooms to accomodate their returning fledglings. In the New York suburb of Babylon, so many homeowners were illegally renovating their houses to accomodate two families (grandparents plus their divorced offspring and brood), that the town was recently forced to make these so-called "mother-daughter" subdivisions legal in some areas.*

There are, of course, many forms of house-sharing that are appearing with greater and greater frequency at the present time. The most basic form of house-sharing is two unrelated individuals sharing a single-family dwelling that is

owned by one of them. Of course, there is an enormous choice of possible ownership and sharing options ranging from a boardinghouse arrangement in which a non-owner has only a bedroom, to a communal lifestyle in which social, financial, and household chores are shared equally among the participants.

The variety of lifestyle options is beginning to be exploited. Even with the legal and institutional resistance to change (clinging to the Second Wave ideals), people are beginning to break out of the stereotypes of the "Ozzie and Harriet" view of normality to include a wider spectrum of accepted lifestyles that can more easily accomodate today's unique culture and the individual

nature of each housing consumer.

**Lynn Langway and others, "Flying Back to the Nest", Newsweek, (April 7, 1980), 86.*

... from now on the nuclear family will be only one of the many socially accepted and approved forms.

Alvin Toffler

Group Living in the Future

As we look to the future, our vision is naturally colored by the economic and social phenomena of today. The struggle to "make ends meet" and a reaction against isolation and depersonalization of city life are causing individuals to "band together in order to survive."

The "return-to-the-nest" movement of young divorced people with children is precipitating a resurgence of the "extended family." Indeed there are indications that the extended family may want to make its new lifestyle permanent. In Westchester County, N.Y., realtor Elizabeth Russo is now seeing at least one extended family a week that wants to buy a house together.*

The beginnings of non-family-related house-sharing groups are now appearing. House-sharing in its various forms seems to be a viable living option for old and young that will probably be further developed and promoted by government and private organizations as well as by individuals acting on their own behalf. As with other cooperative social and economic activities, house-sharing responds to the interdependencies among members of society. As these interdependencies become more apparent through the rest of the twentieth century, requirements for more efficient use of resources will be intensified.

Housing as one such re-

House-sharing could contribute to a more efficient and cooperative society.

*Stephen R.
McConnell*

**Ibid.*

source will have to respond to the new lifestyles of the Third Wave. Alvin Toffler's view of the future includes a new type of technology that is less expensive, more energy efficient, simpler to understand, and able to be implemented on a personal or community level. He predicts that most aspects of civilization will be scaled to the individual with participation replacing representation as the mechanism to facilitate change.

In order to develop creative, responsive design approaches that will keep pace with society's changes, an assessment of the directions being taken by today's design professionals seems worthwhile. The present aesthetic emphasis on post-modernism as expressed in the architecture of Graves

and Stern seems to be based in the Second Wave idea of complexity and elitism. It is non-participatory and non-responsive in nature. In contrast, however, there are many contemporary architects who seem to be holding a vision of the "Third Wave"-type of a future. John Turner in Housing By People argues that people should control their own homes and the economic structures surrounding them. The work of John Habraken's SAR method of design shows the implementation of the idea that users should have an active role in the design-decisionmaking process. Yona Friedman's book Toward A Scientific Architecture makes the case for a human-scaled technology which allows personal participation in one's

environment.

Architecture is slowly turning to recognize new ways for individuals to become active in their environment. There seems to be an emerging emphasis on participation, flexibility, and recognition of many lifestyle options which points toward the possibilities and responsibilities for architects of the future.

Space and Privacy

One innovative response to the critical housing problem in America is shared housing. Shared housing is a radical idea. It requires cooperation and tolerance for other people's habits. It means a certain loss of privacy. For these reasons, some people are skeptical that house-sharing will gain much popularity because Americans are so committed to independent, autonomous living styles.

In rebuttal, the observed preference for autonomous living is somewhat biased by the limitations of today's building stock. Because the existing house market consists of single family houses and cellular apartments, for the most part, and the newest dwellings are

condominiums, the group or connected-lifestyle is simply not provided for.

The issue of limitations of communal tolerance is central to the development of a new housing type that will allow for individual privacy within a communal household.

Amos Rapoport has noted the mechanisms that our culture uses to control unwanted interactions and thus obtain privacy. There are rules, both explicit and implicit, such as manners and hierarchies of "private" activities. Psychological means such as withdrawal, dreaming, and depersonalization can also offer a sense of exclusion or privacy. Culturally defined behavioral cues having to do with tone of

Another aspect of dwelling worth considering is whether to live alone, or with others, and how. Many of us have had a very hard time dealing honestly with this issue, coming, as we do, from a culture which has not cultivated a conscious awareness of the important interrelationship between aloneness and togetherness, and in which the concepts of sharing and community have been virtually lost.

Anonymous

voice and conversational distance, for example, can be used to indicate the degree of "openness" of a conversation. There is also the opportunity for structuring activities in time to avoid or encourage overlapping of activities. Spatial separation through actual physical distance can be an indication of the private nature of a territory or activity. Then there are architectural devices such as walls, doors, curtains, and locks which can physically separate private and communal spaces.* Most often, privacy is maintained through the use of a combination of these mechanisms.

Rules and social mechanisms are really partial substitutes for a lack of physical devices. An increase in density gives rise to the need

for such social regulations that limit the unwarranted intimacy which would be likely to arise in the absence of physical barriers.* Architectural elements, then, are clearly the most effective and most convenient ways to enforce privacy at the level of the individual dwelling or territory.

The social mechanisms are somewhat more powerful at the interface between the dwelling and the community. In urban areas where density is high, home life tends to be closed to the outsider but the larger society is very open. On the other hand, in sparsely populated rural areas, the number of people that one meets is limited and causes a need to know a lot about the people that one does meet. Society

*Robert Sommer, Personal Space: The Behavioral Basis of Design, 41.

Western man uses a complex amalgam of individual ownership, communal ownership, and status relationship to maintain a social order.

Robert Sommer

*Amos Rapoport, Human Aspects of Urban Form, 290.

is closed but the home remains relatively open. Obviously, this type of privacy-defining makes use of social and cultural mechanisms to a greater extent than physical mechanisms could offer.

The problems encountered by non-related individuals living together require many mechanisms for their solution. The designer can draw heavily upon his architectural "bag-of-tricks" and also provide for physical distances between activities but then he must rely upon the users and their established codes of social norms and privacy behaviors to do the interpretation of the environment which will make the place tolerable as a group residence and as a collection of more personal, private areas.

Provision of an individual private area for each occupant is necessary to foster a sense of security and control over one's home. However, some of the advantages of congregate living are the sharing, the nurturing of intimate relationships, and the sense of "union" and "home." These qualities are developed by shared spaces. It has been shown, for example, that there are more friendships in dormitories with common washrooms than in those with private washrooms.*

But what does this tell an architect who wants to design for privacy as well as for friendliness? For one thing, this points out that there should be a qualification placed on almost every quality of a building's pro-

*In this world I lock out
all my worries and my fears.
In my room.
In my room.*

The Beach Boys

**Ibid., p.158.*

gram that too much of a good thing is not always desirable.

A look at the problem of occupants of rental units (often among the new house-sharing participants) can provide some insights as to what degrees of privacy and communality are sought. Occupants of rental units are often less concerned with maximizing square footages than with issues of privacy.* When space is tight, there seems to be a greater need for personal private areas to escape to. Flexibility in terms of the ability to change the unit for new occupants or as space needs of original inhabitants change is considered an important feature. The cause can be seen in an increased perception of the ability of the occupant to manipulate or con-

trol his environment.

Of course, provision of privacies and some concern for the issues of inclusion of adaptive possibilities will be positive aspects of any group-living environment. There are special issues of privacy and abundance of space that are unique to the situation of non-family members living together (see section on "Problems" following the interviews of various congregate living groups).

Also there is a greater need to anticipate normal alterations of lifestyles over time when designing for group-style living than there is when designing a single family house, due to the numbers of people involved. Needs are unpredictable and constantly changing. Intergenerational

*Andrew Rabeneck and others, "Housing: Flexibility/Adaptability", Architectural Design, (1974), 76.

To the renter ... flexible layout can be important as an extension of the very limited franchise he currently holds on rented property. Through the ability to create his own environment within a rented area, the renter can achieve in a different way some of the freedoms normally associated with ownership.

Andrew Rabeneck

dependencies change as do friendships, economic, security, and recreational needs. Storage and space requirements may change on a monthly or annual basis while the need for a different type of access or mobility may change slowly over the life cycle of the occupants. These changes are only loosely predictable, and should therefore not be provided for in a "tight-fit", functionalist manner. Overprovision of space (termed "slack" space) may be the answer, yet care should be taken in considering the amount and location of such "extra room."

We can clearly see then, that group-lifestyles will require new architectural as well as social responses. Privacy needs increase and flexi-

bility is highly valued in a communal setting. More effort must be spent on anticipation of changes not only in group composition but in individual space and privacy needs.

Interviews

Styles of Congregate Living

The possible reasons for and social structuring of congregate living are as various and different as are the individuals in society at large. In order to get a closer look at the special problems and demands of congregate living groups, some interviews of such groups were made. Three of these interviews are presented in an attempt to document the different social modes of sharing as well as the actual buildings that these currently functioning groups have chosen to accommodate their shared lifestyles.

The three groups interviewed represent a spectrum of shared/private space use and social structuring. One group shares all expenses and

chores and lives together like a family in a large farmhouse. Another group is probably best described as a boardinghouse situation with one person carrying on the management, meals, and maintenance jobs but all members sharing in the social and economic life of the house. Members of the third group maintain a certain degree of autonomy by privately owning a self-contained apartment while at the same time connecting themselves to the small "community" by supporting some commonly used facilities. This sharing pattern is similar to that found in a village, for example.

NOTE:

The selection of these particular groups is intended to illustrate a range of life-style and is obviously a limited sample of shared living styles. The interviews of residents were conducted at the various dwellings on an informal basis. They are not intended to be presented as solid social science research, but only as examples or non-rigorous case studies of actual non-family-related groups which share houses.

Problems that the groups have found with their dwellings are isolated and discussed following the interviews. Solutions that may not be directly applicable to

the illustrated current dwelling but which are generally applicable and particular to shared living situations are presented as a step toward deriving patterns and guidelines outlined in later chapters.

The groups interviewed will also serve as models or prototypes of three styles of group living which will be used to test a design solution later in this thesis. Inhabitations of a basic "framework" in each of the three different modes (farmhouse, boardinghouse, and village) will be illustrated and evaluated.

People's needs are neither rigidly fixed nor infinitely varied. There is a price to be paid for every environmental adaption, and frequently that price is the disappearance of species members who could not make the change. When we speak of 'user behavior' we do not mean some hypothetical adaptation of which some humans somewhere may be capable, but rather the behavior of the immediate or prospective occupants.

Robert Sommer

Interview : A Farmhouse

A group of five young adults share a house (once converted to a duplex) in Somerville, Mass. and find the shared living situation not only economically advantageous but socially stimulating and rewarding. The residents, some of whom share an M.I.T. affiliation, include a young married couple and their 17-month-old daughter who claim three rooms at the rear of the second floor, an independent bachelor who inhabits the large front bedroom (the one with a bay window), and a pair of lovers who share the attic space. All of the residents (with the exception of the baby) are the same approximate age (around 30) and share many common political

and philosophical convictions.

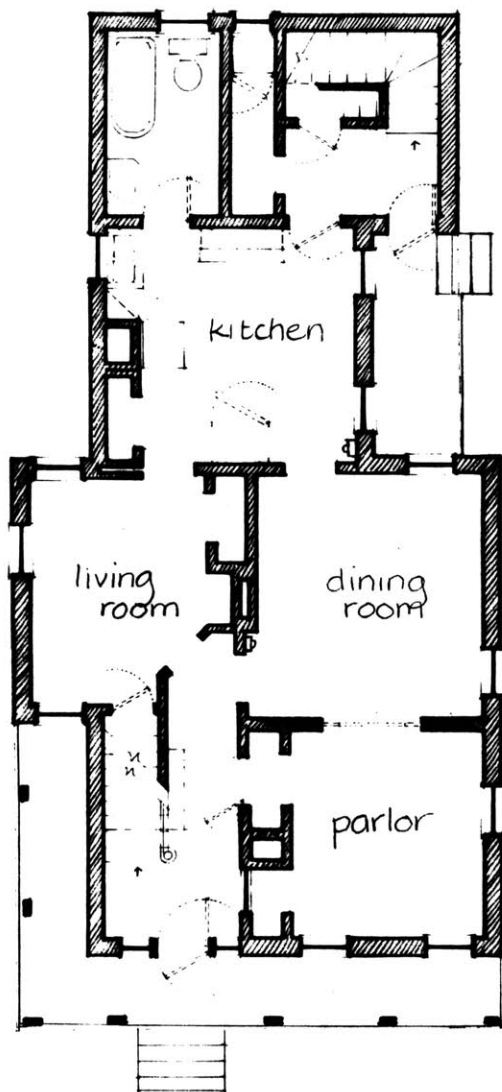
With the exception of the bedrooms and the small room off the hall on the second floor, all the rooms in the house are used communally. The front parlor has at times in the past been used as a private bedroom but presently it serves as a common living area. The small room at the front of the house on the second floor is used as a guest room for visiting relatives and out-of-town friends.

The affairs of the house such as finances, cleaning, meal preparation, maintenance, and grocery shopping are all dealt with on a cooperative basis. The group has developed various scheduling systems for dividing up tasks and dis-

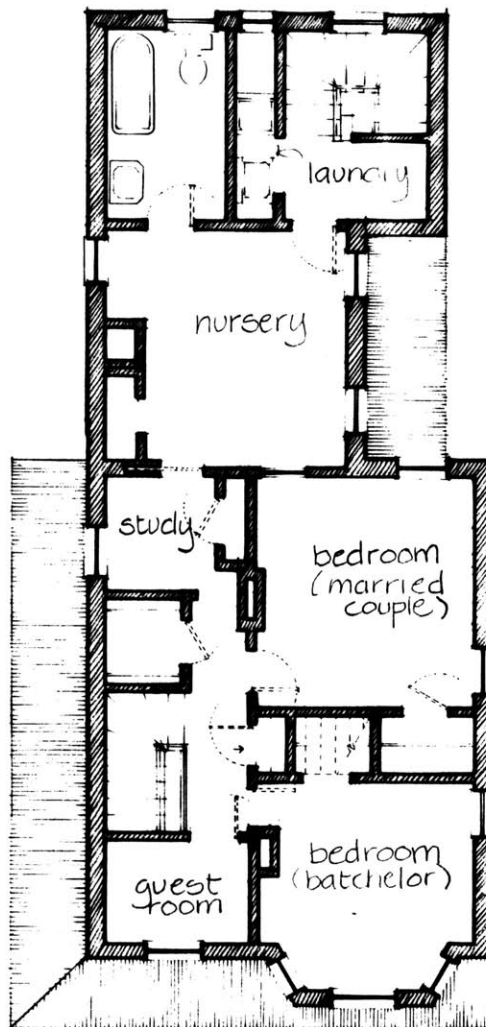
tributing finances equitably. Each member of the household is an owner (to the extent of the amount of money that has been paid in by each individual). Newcomers may obtain ownership by buying someone else out. This financial arrangement seems to keep everyone involved and concerned with the upkeep of the house.

The intimate size of the group seems to produce a "family" atmosphere in which chores are shared and time and energy are given to projects which benefit all members of the household. This type of communal life is perhaps best typified by the type of family cooperation found in rural farmhouses.

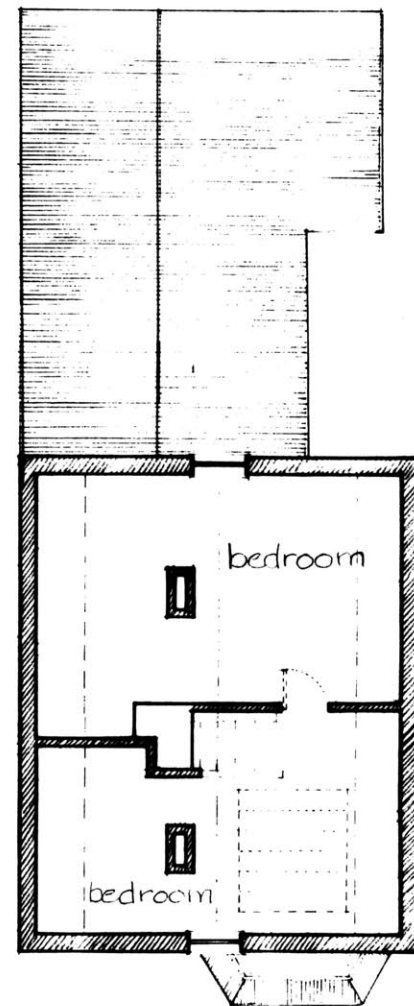




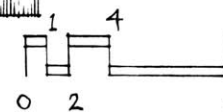
FIRST FLOOR



SECOND FLOOR



THIRD FLOOR



Food Preparation

The kitchen is a totally shared facility. All members of the household participate in the preparation of meals and alternate cooking with cleaning up chores. Although there is no cooking schedule, the group members are conscientious about whose turn it is to cook or shop or wash dishes. Breakfast is the one meal that is individually prepared. All food is bought collectively from a local food coop. There is a list for special requests for items in addition to regular staples.

The kitchen is adequate for meal preparation by two cooks at a time but space is cramped for informal eating in the kitchen. It is difficult for more than four adults to eat in the kitchen at one

time. The baby adds special requirements such as keeping certain items on the table out of reach. This further reduces the functional capacity of the in-kitchen eating area.

The kitchen tends to be a gathering/social area but there is really very little undisturbed space for lounging and conversation. Diagonal paths of through circulation criss-cross the space and there remain no out-of-the-way corners in which to relax or hang out.

Entertaining

Overnight guests are easily accommodated in the small guest room on the second floor. This space routinely remains unused (except for storage) but is greatly appre-

ciated on occasions such as the arrival of out-of-town friends or relatives. There is also a small furnished room in the basement that is occasionally used to accommodate guests (especially in the summer months when it offers a cool atmosphere). On special occasions when the guest rooms are full (i.e. holidays, arrival of the baby, etc.) the front parlor can be easily shut off by means of the pocket doors to act as another guest bedroom.

When guests are invited for dinner, the extender or extenders of the invitation usually are expected to plan and prepare the meal and all members of the household are included. Very little private or non-communal entertaining involving food takes place.

The domestic entertainment centers around the T.V. in the front parlor or listening to music in the smaller living room near the kitchen. The individuals seek personal recreation such as reading or hobbies in their own rooms but very little entertaining of outsiders occurs in the individual territories. There is some sense of lack of space associated with the private territories in which to entertain personal friends (one or two at a time) without having to be part of the whole household.

Personal Care

There are two full bathrooms located one on each of the lower two floors. Both bathrooms have identical layouts and are considered too

small. The layout and lack of adequate space for maneuvering limits their use to one person at a time. Because it is impossible to double up (allow one person to be showering while another brushes his teeth, for example), which the residents are willing to do, an informal morning use sequence has developed.

The locations of the bathrooms (both necessitating passing through another space) also causes availability problems. The bathroom on the first floor tends to be used most by the bachelor and the occupants of the attic (quite a hike!), due to the fact that only the downstairs bath contains a shower and because access to the second floor bathroom is through the baby's room. On the other hand, the

bathroom facilities in close proximity to the nursery are appreciated for convenience when caring for a sick baby or cleaning up inevitable messes.

Laundry facilities are located in the back of the second floor near the rear stair landing. This proves to be a convenient location as well as an economical use of existing space. Having direct access from the baby's room is a positive aspect and having the option of a second route to the washer and dryer allows their use even when the nearby nursery is occupied by a sleeping child. Laundry is a personal chore, not usually a shared activity.

Identity and Autonomy

The house itself reads from the street as a single-family dwelling. There is one prominent door on the front facade which is used by all. This image seems quite acceptable to this group of residents who like to identify with the entire household as a type of "family."

The dwelling is organized as most typical American single-family homes--common areas on the entry level with privacies above. The individual territories are quite autonomous and influenced in decor and furnishing by the individual occupant or occupants alone. The private rooms are reflections of the tastes of their occupants in terms of color choice, decorations, and

level of cleanliness and upkeep. The common areas, however, are heavily influenced by decisions made by all the members of the household. Certain color choices and selected pieces of furniture are financed and chosen by the group as a whole.

The group has worked out the telephone problem through an ingenious system involving two telephones--one for incoming and one for outgoing calls. For one phone (the number they give to friends, etc.), they pay for the minimum service and for the other, they pay for all the service plus long distance service that they need for their own calling. This system allows more than one resident at a time to be using the telephone.

Both phones are located on the ground floor--one in the kitchen and one in the hall near the dining room. This does not allow for much privacy when carrying on conversations but it does reinforce the use of common areas and facilitates message taking.

Changes to the Building

The house was at one time converted from a single-family dwelling to a double occupancy flat. Plumbing was provided to the back portion of the middle level allowing a second kitchen and bathroom.

When the original group (some of the current residents were not members of the founding group) purchased the house in the late '60's, the house was being used by one family.

Over the years many improvements and changes have been made to the house, the most significant of which was the enlarging of useable square footage by converting the attic space into bedrooms. Painting, extra insulation in ceilings, and additional counter surface were all group projects to enhance the quality of the environment. Maintenance and repairs are usually supplied by the residents although some tasks such as gutter work and removal of lead paint require the help of professionals.

The group has a novel way of initiating and accomplishing major renovation projects such as installing the attic skylight. An individual may receive as a birthday gift the opportunity to select a pro-

ject for the group to work on. House project week-ends are planned and all members of the household pitch-in to work on an improvement to the house (-it usually increases not only the quality of the environment but also the re-sale value of the house).

Interview: A Boardinghouse

Ms. Nancy Cushman, a widow living in a large, Civil War vintage, single-family house in Sharon, Mass., decided that living by herself was isolated and unpleasant so she considered sharing her home with another single woman. Through a series of events, however, she found herself renting rooms to young working men. She now enjoys the sense of family or "campus living", as she calls it, while maintaining ownership of the property and a low-key "landlady/housemother" role.

The three men each have a private bedroom and they share the upstairs bath. Ms. Cushman uses the downstairs powder room and maintains a private study in addition to her bed-

room. All other spaces including the kitchen, dining room, and living room are used communally.

Expenses such as food, telephone, etc. are shared. Ms. Cushman presents each of the residents with a monthly bill which is prepared with the aid of a calendar notation system and includes a figure for rent.

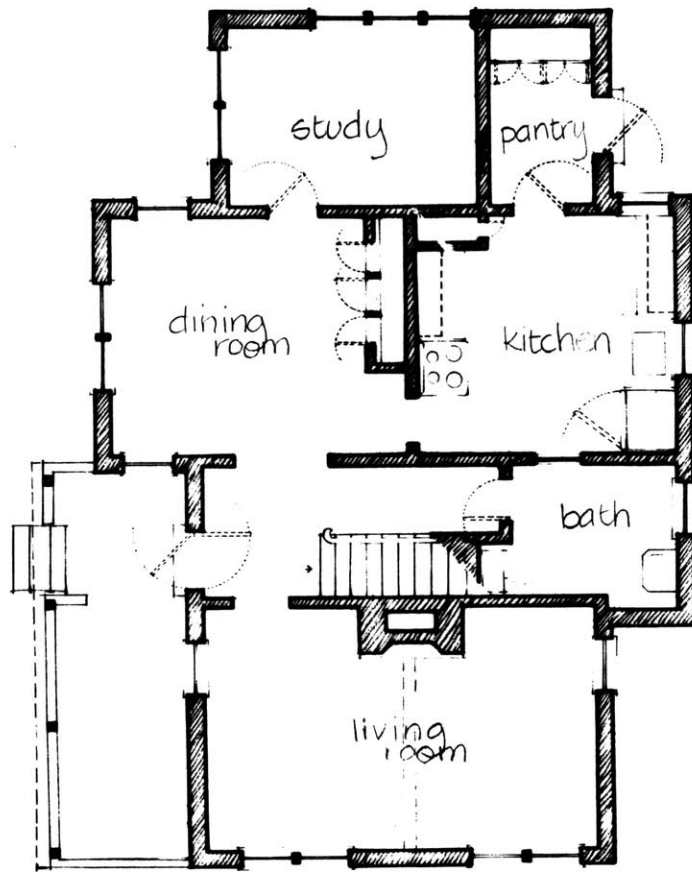
She is primarily responsible for cleaning and maintaining the house. Household chores are not shared although the men are expected to pitch in by putting up storm windows in their own rooms, for example.

The men usually stay for about two or three years and are not typically involved

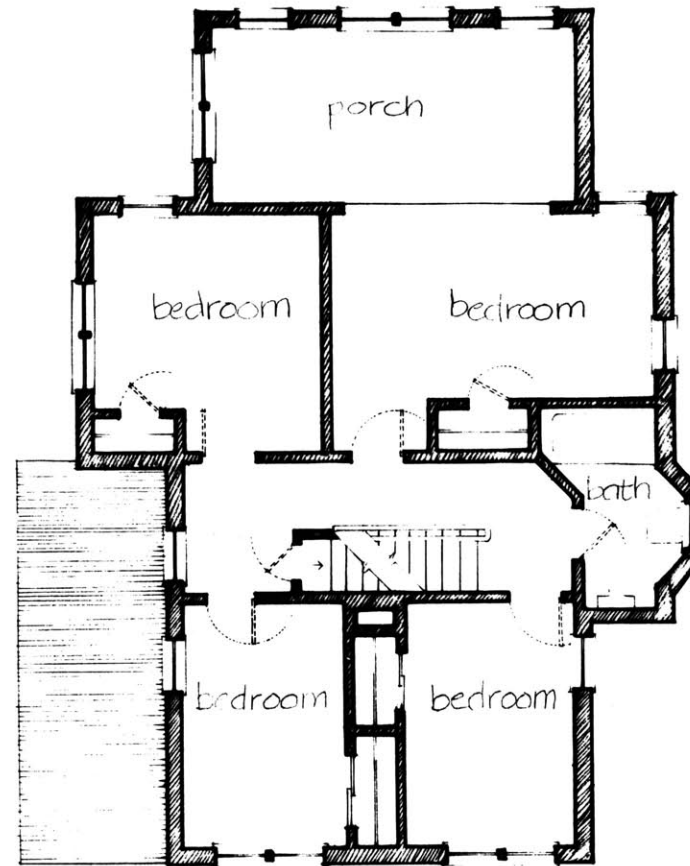
in the decisions concerning new members of the household. There was a consultation, however, when female newcomers were considered. The group decided against it.

This style of living is probably closest to the style in a boardinghouse. It differs from a boardinghouse substantially in the "family living" spirit of the group, the non-scheduled nature of meals, and the nucleus of a common religion (Christian Science) which they all share.

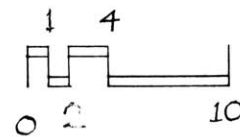




FIRST FLOOR



SECOND FLOOR



Food Preparation

The kitchen is shared by all with each person storing individual provisions on a separate shelf in cabinets and refrigerator. Meals are frequently prepared individually, but Ms. Cushman enjoys fixing dinner for the group on Sundays and when she is expecting the three men home at one time.

The kitchen seems adequate in size and facilities. There is really no informal eating area in the kitchen and it has been suggested that a counter with stools for one or two person meals be installed in the kitchen. The layout of the cooking facilities might be improved reducing the distance from sink to stove. Despite its large size, the kitchen is sometimes inadequate

for more than one cook and a sort of informal schedule must be implemented in order to share in its use. It also doesn't seem to be a much used room for informal gathering and chats, perhaps because there is no place to eat or take snacks within the kitchen itself.

Entertaining

The Group is small enough so that guests are usually entertained in the company of the whole group. Dinner guests are easily served in the spacious dining room and parties are usually group events (attended by all members of the household). Overnight guests (including girlfriends) are accommodated on a cot in Ms. Cushman's study. At times, a separate guest

room would be appreciated for out-of-town friends and relatives.

The group finds domestic entertainment in front of the the living room fireplace or singing around the piano. The T.V. is located in the living room and precipitates occasional conflicts involving program selection and other simultaneous uses of the living room.

Personal Care

The men share the upstairs bathroom and work out a schedule on an informal basis. Ms. Cushman has exclusive rights to the downstairs half-bath and bathes when the men are away or whenever the bathroom is free. Most of the time she must put up with the inconvenience of

going down a full flight of stairs and through the public entry area of the house-- a very inconvenient condition.

Laundry presents a problem of scheduling and personal irresponsibility impacting on others in the group. The washer and dryer are located in the basement so space is not a problem; however, removal of wet clothes and back up of loads of laundry because the owner forgot or went out of the house is a recurring problem (one that doesn't arise in households in which one person does all the laundry).

Identity and Autonomy

Being originally a single-family house, the building itself displays only a feeling of family or group and very

little evidence of individual territories on the building's exterior. The front entrance is used by all and there is no way to come in and out without passing through the public areas of the house. Individual territories are respected by a common understanding that when a bedroom door is closed, its occupant wishes privacy. Within each private room, the occupant is free to change furniture around, add his own belongings, and put up decorations such as maps or posters. Individual personalization does not extend to the common areas of the house (i.e. kitchen, living room, dining room).

The telephone is shared and causes occasional intrusions to privacy when one person lifts the receiver while

Home is an inward thing, really - it's more than a shelter, for it provides the necessary refuge of peace and privacy, and the important ingredient of mutual consideration.

Nancy Cushman

another is already on the line. There is acoustic privacy for the upstairs phone provided by a long telephone cord which allows the men to pull the phone into their rooms and shut the doors after them.

space. Of course, much rearrangement of furniture has taken place but room functions have remained fixed.

Changes to the Building

The house has had a very long history and has undergone many renovations. It was repaired and "modernized" by Ms. Cushman's father. More recently, the downstairs powder room door connecting it to the kitchen was blocked up. Many doors separating the downstairs rooms were removed (the swinging door from kitchen to dining room, for example). The porch upstairs was enclosed and linked to the large bedroom to provide additional year-round living

Interview: A Village

A group of nine working people share a double triple decker in Dorchester, Mass. The building is jointly owned and one portion of the lower floor is maintained communally to provide facilities for group meals and space for group activities. The occupants each have small apartments, many with individual kitchens and bathrooms but they appreciate the "family" atmosphere of belonging to the larger household. Backyard space and an entry and central stairway are also shared.

Two young working women share the first floor kitchenless apartment and therefore use the group facilities quite frequently. The ~~second~~

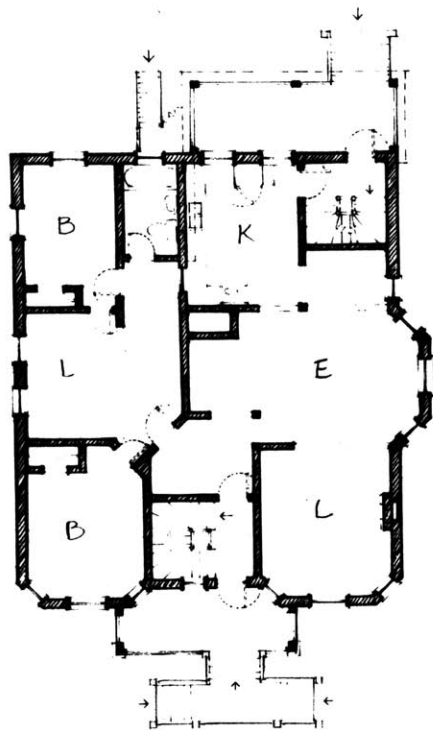
second floor is composed of two apartments, one occupied by a bachelor and the other by a married couple. The third floor houses two more couples. One upper level apartment includes a painting studio. All members of the household hold jobs outside of the house. The ages of household members range from 28 to 42 yet quite a few aesthetic, political, and philosophical ideas are held commonly.

The individual apartments are considered private and responsibility for cleanliness and decor are left to the individual occupants. The first floor common rooms, backyard, and the stairway are used by everyone.

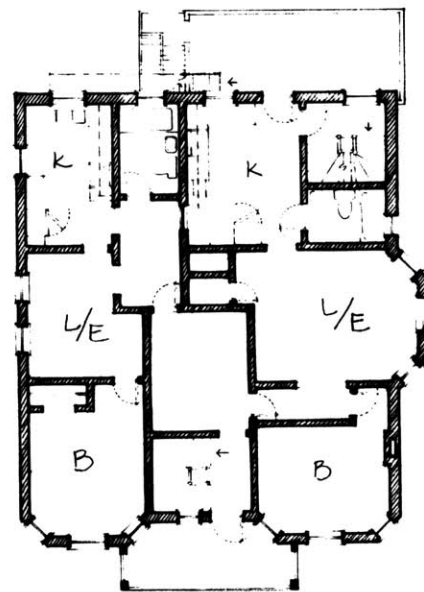
The financial set-up reflects the nature of the extent of sharing. Each occupant is a joint owner of the building. Monthly payments maintain common spaces and heating and electrical costs as well as the individual apartment spaces. If a member or members wish to leave the household, other household members are given first chance at buying their shares in the house, and in any case, have absolute judgment concerning new members.

This lifestyle is somewhat similar to the type of sharing in a village, in which each member has his own private territory but also contributes to aspects benefiting the entire group.

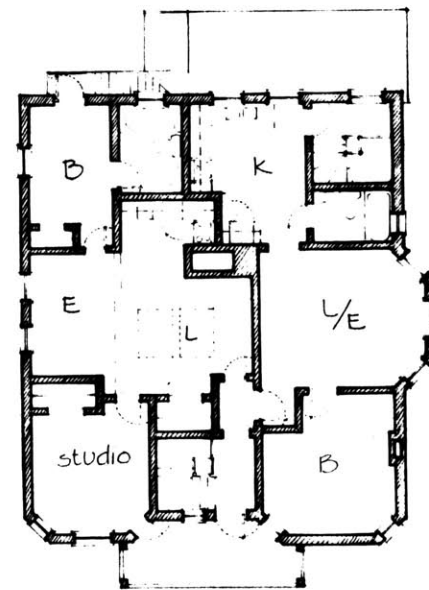
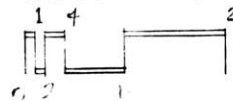




FIRST FLOOR



SECOND FLOOR



THIRD FLOOR

Food Preparation

Most meals are individually prepared in the small kitchens within the apartments. Breakfasts are always individual and lunches are frequently eaten at various workplaces. Due to the uncertain and varied schedules of nine independent adults, most dinners are eaten in the individual apartments also. Wednesday and Sunday dinners are usually attended by everyone, and prepared by household members two at a time on a rotating schedule. Those who prepare the group dinners for the week are responsible for shopping for those meals. Clean-up is usually shared and is often seen as an activity which brings members of the group together.

Since the common kitchen is not in constant use, space is not overly generous. Large equipment for storing and cooking meals for nine or more is provided, however. For efficiency the group has decided to limit the number of cooks in the kitchen at any one time to two people. There is a table which is used for chopping, etc., and occasionally for snacks and coffee when the meals are not in process.

Entertaining

Guests are usually accommodated within the individual apartments. All of the apartments have living rooms which can be used as sleeping spaces for overnight guests. On rare occasions the sofa in the common living room has been used

for the same purpose, although this is somewhat awkward due to the unscreened, non-acoustically-separated nature of the common space.

Dinner guests are often included at the group dinners. Usually friends of the preparers are invited, but no more than three at one time, as the dining room table can only accommodate twelve people comfortably. Of course, private entertaining involving snacks and meals also takes place in the individual apartments although most apartments do not have a formal eating area.

Holidays are not usually celebrated by the members as a group since they all have relatives and friends that invite them to share in festivities. The household members

do regularly pool resources and throw an annual party to which they invite people who are joint friends. This party usually involves a lot of coordination and is a prime facilitator of a "group sense" of the household.

Personal Care

There are relatively few conflicts in this area, since each apartment has its own bathroom. While this can be seen as a real redundancy of services, it is the one thing that the residents appreciate most. They say that they would much prefer to give up their small kitchens if it came to an issue of trade-off with their own personal bathrooms.

Laundry facilities are located in a closet under the

back stairs on the first floor. This location was preferred over the previous basement location but still presents difficulties when the common kitchen is in use. Many members of the household have simply adjusted their laundry schedule to avoid the group meal times but others have decided to take their laundry to local laundromats. This necessitated a pay-by-the-load system of financing the washer and dryer and the utilities which they need.

Identity and Autonomy

The facade of the building connotes a multiple-family dwelling but also presents only a single door to the street. The building, being an independent structure with many stratifications within,

is a good reflection of the nature of the social grouping of the household inside.

The central circulation and the common entry help give the feeling of a "home." Members of the household have a strong sense of belonging to the group, yet they can tell a visitor or repairmen how to find their individual territory inside the building.

The individual apartments are almost totally autonomous. Furnishings, wall coverings, and interior finish materials are chosen and installed by individual occupants. There is also a group participation atmosphere to the place, as evidenced by doors to apartments being left open to common hall areas, small groups of residents watching T.V. or having coffee in one of the

apartments and a common "plant hospital" in a sunny window in one of the apartments.

The members share a telephone line. This causes a great deal of confusion and loss of privacy even though there is an extension on each floor plus a phone in the common kitchen. Interruptions (of the kind where one person is on the line when another picks up the phone and begins to dial) are common and there is usually quite a wait for the phone in the evenings. Some members have suggested paying for more telephone lines, perhaps a different one for each floor.

Changes to the Building

The building was originally three large apartments, one on each floor. This

necessitated the addition of two new bathrooms, one on the second floor and one on the third floor. Bathroom and kitchen locations were confined to the rear portions of the building near to existing piping.

Fire escapes were also required by code when more interior partitions and doors were added making more sub-units.

The second floor remains truest to the original floor plan and the third floor apartment containing the painting studio is perhaps the most "adjusted" or "modified" area of the building. Interior walls were moved around considerably and two skylights were added.

When major modifications concerning walls or the build-

ing's skin are anticipated, group approval and often group support (financial and physical) is required. The members of the group frequently discuss minor changes to the building and routine maintenance problems. They recognize the value of pooling their efforts in this area, because as partial owners, each has a stake in making the house a nicer place in which to live.

Summary of Problems Discovered

PROBLEM: "The bathroom's too small!"

- There's very little room to maneuver.
- Two people cannot be in there at the same time.
- Mornings are sometimes a hassle with everyone wanting to use it at the same time.
- Waiting for the john is a pain - literally!
- Showers should be showers - not tubs.
- The bathroom is always a mess. We hate to have guests use it.

SOLUTIONS:

- Increase the number of bathrooms (at least provide half-baths for the use of small sub-groups of the household).
- Increase the square footage of bathrooms.
- Allow pieces of equipment to be shut-off from the rest of the bathroom and independently accessed to allow simultaneous use.
- Provide shower stalls as well as tubs.
- Provide at least one half-bath to be used communally and to be kept nice for guests.

PROBLEM: "The kitchen's too small!"

- More than two cooks is impossible.
- There's no place to "hang out" for a cup of coffee in the kitchen.
- Most of our household scheduling and bills are discussed in the kitchen. It would be nice to have a desk there.
- Finding storage space is always a problem.
- It would be nice to have more connection to the dining room to pass plates back and forth, for instance.

SOLUTIONS:

- Increase the square footage of kitchens.
- Provide space for a pantry, shelves (both overhead and below counters), and space for an extra appliance (i.e. refrigerator or freezer).
- Provide for the possibility of an open connection to nearby eating spaces.
- Provide some in-kitchen eating space.
- Provide space for a desk and telephone for household business activities.

PROBLEM: "There's no way to come and go unnoticed!"

- The front door is the only way out.
- If somebody else is entertaining guests in the living room, I am obliged to meet them when I come in, regardless of my appearance or previous activity.
- Coming in late at night could disturb others.
- I wish I had my own mailbox.

SOLUTIONS:

- Provide options for entry and exiting (more than one door and more than one vertical circulation possibility).
- Carpet stairs to reduce noise.
- Provide each resident with a private mailbox near the entry.
- Provide an entrance removed from the formal, common areas of the house (fire escape-type stairs might be the answer).

PROBLEM : "I wish my room was just a bit bigger!"

- My private territory is only one room.
- Finding a place to store all my junk is a real problem.
- The only way to be part of the house while in my room is to leave the door open.
- Another window would be nice.
- I wish there was a way to accomodate overnight guests, for instance, when my sister visits me.
- If I only had a wash basin in my room, life would be so much easier.

SOLUTIONS:

- Increase the square footage of individual private territories.
- Provide variable links to the public realm (i.e. interior windows, or sliding walls, or shutters).
- Provide more space for storage (more than normally provided in the average single-family house).
- Provide the possibility for a sink or small half-bath directly associated with each private territory.
- Provide small, shared living spaces which could be occasionally used as guest rooms (shared by occupants of a couple of different private territories).

*Flexibility,
Adaptability,
Tractability*

Past Attempts

Architects really began to focus on adaptable buildings with the advent of the "functionalist movement" in the 1920's and 30's. The enthusiasm of many zealous "functionalists" sprang from the idea that for centuries man had to adapt himself to his dwellings but from now on dwellings will be made to adapt to man because the technology exists to make them do so.

This was a noble and quite sensible ideal but the buildings that were produced by many so-called "functionalists" showed only minimal concern for human behavior and desires--the very reason for their credo. Frank Lloyd Wright put forth the doctrine

"form follows function" as a rebellion against the historical repetition and outrageous ornamentation so prevalent at the turn of the century. Yet quickly the functionalists turned their attention toward form and away from function.

It was as if the structure itself- the harmony with the site, the integrity of the materials, the cohesiveness of the separate units- had become the "function" of building. Relatively little emphasis was placed on activities taking place within the structure.*

Perhaps they were diverted from their original intent because there existed, at that time, relatively little behavioral and environ-

*Robert Sommer, Personal Space: The Behavioral Basis of Design, 3.

mental social science research and because they were architects (architects for the most part schooled in the Beaux-Arts tradition) who were trained to deal with issues of form. Nevertheless, they had enough vision to at least voice the need for more responsive buildings. From their inspiration many small "movements" have blossomed.

"Flexibility", "expandability", "self-help", "do-it-yourself", "sites and services", etc., are all ideas and realities that have shared the functionalist ideology and have been actively expressed by designers, theorists, and users of places all over the world.

European countries with shortages of material and a limited amount of developable

land have been the first to experiment with "flexible" or "adaptable" housing. The theories and research efforts were motivated by a desire to make a precious resource (housing) have a longer non-obsolescent life and to provide a pleasant environment for people in order that they might be motivated to invest more care in their dwellings, making them last longer.

In Sweden, a shortage of skilled on-site labor and a totally saturated housing market led to the utilization of moveable partitions. These easily manipulated walls cut down on the amount and quality of on-site labor and provided a marketing bonus because new interior layouts could be easily arranged to suit the needs and preferences of any

size family.

In France and Germany, a "tight-fit" concept of functionalism was causing a high rate of obsolescence. The governments soon began to encourage the idea of flexibility in plan layout.

The Netherlands had the problem of inadequate mass housing production and looked to a "flexible" system with many options that would permit personalization of living environments (i.e. the SAR method).

England's rapid inflation and wide income differential caused experimentation with extendable, incremental houses which allowed a greater segment of the population to participate in the housing market.

In observing all of these

developments, we can conclude that most of the solutions entail some degree of overprovision above and beyond what might be considered "normal" (i.e. additional area, moveable partitions, more linear feet of exterior wall, etc.). This seems to be an essential factor when seeking out multiple interpretations and adaptive possibilities.

Another factor that must be considered is user participation in the environment. Most "flexible" housing schemes would simply fail without it. Some architects have taken the position that participation must be encouraged, even forced, if the project is "to fly."

One method of "forced participation" that has been tried is overprovision in

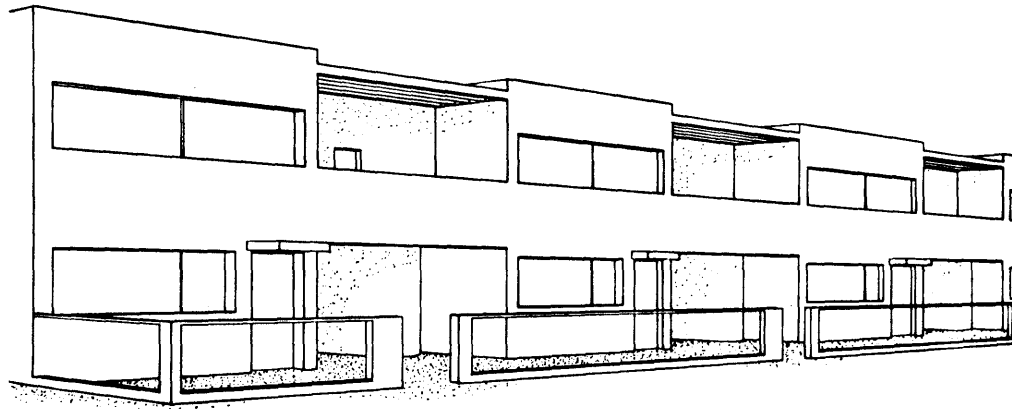
anticipation of user rejection. Architect Lucien Kroll in his La Meme student housing project at Louvain provided brightly flowered curtains anticipating that people would hate them and replace them with curtains of their own choosing. It was felt that this would provide for an awareness of the possibilities for change and thereby encourage further modifications to the environment.

Le Corbusier's workers' housing at Pessac used an economic incentive to force participation. Many of the interior walls were left unfinished, making the dwelling exempt from a 7% tax on finished housing. Not only did this allow the architect to provide a bit more square

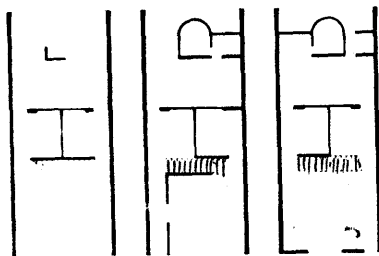
footage (due to the money that was saved), but it also served as a catalyst to get people to finish, change, and personalize their homes.

The whole prefabrication of homes movement and the idea of modular planning that accompanies it is another method of encouraging participation. Carl Koch, father of TechBuilt modular homes, had the idea of providing packages of pieces and additional modules for expansion. The pieces are cleverly designed to fit together in a variety of ways, forcing the user to choose how his house will be organized.

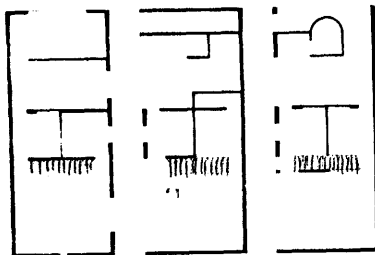
These examples are cited to illustrate only a few of the ways that "flexibility" has been implemented in the past. In a more general sur-



Housing at Pessac, by Le Corbusier (before)



Plans, housing at Pessac (top, before; bottom, after)

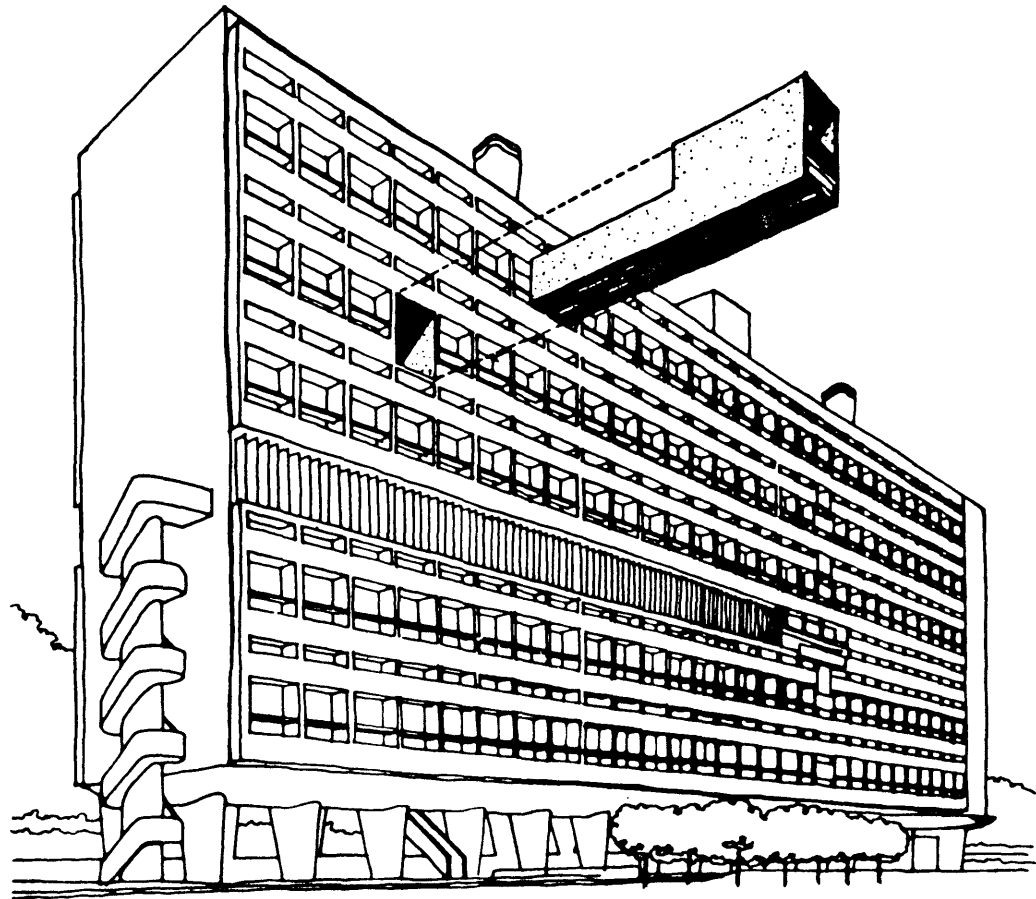


Housing at Pessac (after)

vey, we can see that past attempts fall into categories best described in terms of analogies.

The analogy of the "wine bin", for example, has been used in describing projects which utilize a clear, rigid structure which supports individual, contained units. Corbusier's Marseilles Block is an example of this type of housing. Today the appeal of the industrial loft building for conversion to housing stems from this "minimal structure", or wine bin approach to flexibility.

Another analogy similar to the wine bin is that of a "bookshelf". Townland proposed this analogy which still requires a separation of structure and infill but incorporates some ambiguous



space for interpretation. His idea is that bookshelves contain more than just books. They also hold plants, bric-a-brack, shells, etc. In

other words, the building should leave some "slack" which can be interpreted by the users.

A famous analogy is that of the "seed". Providing an initial "pod" or small dwelling with optional possibilities for growth, Danish architect Peter Stephensen, Carmen Corneil, and many others have worked to develop and market this idea.

The "game of chess" analogy was offered by Carl Koch as an alternative to the inflexible, anonymous nature of prefabricated mass housing. The idea is that the house is created by a kit-of-parts (the board and pieces) and guidelines for their assembly (rules of the game). The house is then "played out" rather than predetermined and

personalization and choice are encouraged.

Obviously, one can observe many other analogies. However, the task facing today's designer is not to invent new analogies but to provide good dwellings that incorporate the goals of flexibility, user participation, and growth that inspired the analogies. Naturally, it is often easy to get caught up in the analogy and end up with an inefficient, dehumanizing building. Moderation and consideration of the higher goal of provision of a congenial, life-giving environment are crucial.

A building which provides more flexibility than anyone wants, or needs, at a higher cost than anyone can afford, in a form that nobody likes, is not likely to find favor with its neighbors, regardless of the analogy that led to it.

Sam Davis

Definition of Terms

Before exploring the methods for increasing the life of buildings and defining terms such as "flexible" and "adaptable", let us first examine the characteristics of what exists. Present day buildings have many features which are not considered progressive when advocating adaptable, personalizable, long-living dwellings. Andrew Rabeneck's list of characteristics illustrates this.

Today's dwellings:

- 1. Provide space for one function only.
- 2. Proportion rooms for intended use.
- 3. Provide function-related furniture

and fittings.

- 4. Provide lighting sockets located according to room function.
- 5. Provide windows placed and sized to reflect room function.
- 6. Generally provide only one living space.
- 7. Make use of corridors for room access (to most rooms except living rooms).
- 8. Provide single door access to all rooms.
- 9. Locate rooms on basis of shortest distance adjacency (kitchens next to dining rooms).*

**Andrew Rabeneck and others, "The Structuring of Space in Family Housing: An Alternative to Present Design Practice", Progressive Architecture, (Nov. 1974), 102.*

There are basically just two strategies for dealing with buildings with these characteristics. Once they are "past their prime" (in other words, behavioral customs have changed and they are no longer the ideal living environment) we may scrap the building entirely noting that it was highly serviced, single purposed, and quite sensitive to change. The other option is to stop building these types of dwellings and turn our attention toward "designing-in" adaptation possibilities.

There are many actions which people can take in order to make their dwellings more comfortable. Perhaps a new, more adaptable form of building could learn much from employing the following

concepts.

In other cultures, notably the Japanese, perceptual privacy is employed as a substitute for actual, physical barriers. Social conventions and mental barriers seem to be one way that people can adapt to crowded environments, for example.

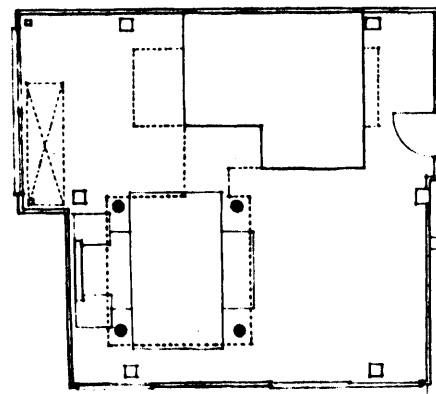
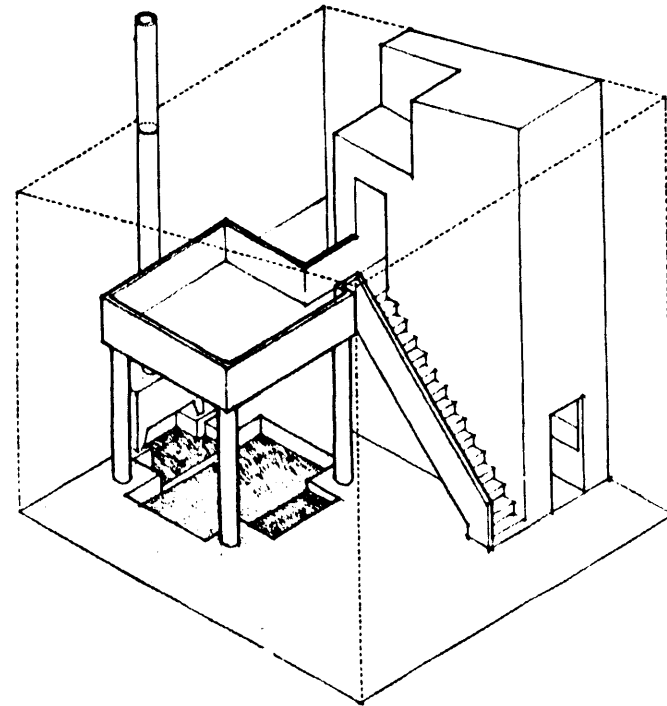
Increasing space is another way to adapt a dwelling. The structure must be "over built" to allow for expansion. Also there needs to be some type of regulatory mechanism for negotiation of expansion with one's neighbors.

Re-allocating space through the use of moveable partitions and the like is perhaps the most studied method for increasing possibilities within one's own housing unit. Careful correspondence

to fire exits, mechanical systems, and window openings is necessary.

Space can be reconceptualized. Sleeping lofts and partial definitions between spaces are some of the ways that one can re-interpret his living space. The concept of a space-within-a-space (a canopy bed is a minimal example) is another way in which designers are reconceptualizing residential space (see Sea Ranch condominiums by MLTW).

Equipment can also be reconceptualized. The hide-a-bed sofa and storage walls are recent examples of furnishings which can change room definition. Other examples for the creative interpretation of space are moveable kitchen and bathroom equipment and roll-away beds which may be



Flexible buildings whose internal dimensions can be varied overnight are one solution to the problem. The other common solution is to provide different sorts of spaces that can be used as needed.

Robert Sommer

**Chester Sprague and others,
"Extended Outline", 12.*

stored under level changes and platforms.

The designer of a building may remain aware of these concepts but basically he has only two ways to influence the adaptation possibilities of his building--providing for choice, and allowing change. To encourage participation by the user, he may provide a variety of unit layouts and/or a variety of sizes of spaces within units to enable the inhabitants to exercise a wide play of choice in the use of the built environment and he may provide a clever structural system which provides clues for changes or adaptations to the physical structure.

In doing so he contributes to what we will call the building's "tractability".

The word "tractable" comes from the Latin "tractabilis" or "tractare", meaning manipulable, manageable, or pliant. One obsolete meaning for tractable is "capable of being handled or touched." For our purposes, it is this sense of tactile, hands-on engagement of users with the physical pieces of architecture that is intended.*

Within the concept of tractability there are the concepts of "adaptable" and "flexible" built environments. Adaptability relates to choice while flexibility focuses on possible changes. Adaptable environments make use of ambiguity and generosity of space to enable buildings to change use over time with a minimum of demolition to the structure itself. Flexible

housing employs a careful location of construction elements and service distribution along with moveable partitions and convertible equipment to allow environments to change over time but within a particular housing context.

Tractable architecture also includes the ideas of "add-on" and "add-in". These ideas correspond to the earlier mentioned concepts of increasing space and of re-conceptualizing space. The "add-on" idea requires some construction overprovision (in the form of paved patios and exterior sills or low walls) to indicate possibilities for expansion. The "add-in" idea requires some slight overprovision in terms of building volume (for example,

higher ceilings or dormers) and a redundancy of structure to achieve new types of spaces-within-spaces (also lofts, etc.).

The whole impetus for tractable environments is the fact that, given an opportunity, people will make varied and fluctuating decisions about how they will use and adjust their physical places. "The physical forms and materials work together and separately to produce in-place options for choice to support these decisions. Should the range of choices not extend far enough, then the users will tend to change the places..."*

Elements of form and materials are quite important to the degree of tractability of an environment (see section on

... I think that through making things, if we're sympathetic and respectful to the contribution of intrinsically different materials, processes, and definitions we can develop a "friendly collage" attitude, which allows respectfully that people are also different and that their differences can be built. We don't need to find a reductive common denominator.

Maurice Smith

**Ibid.*

**Ibid.*, p. 36.

Building Materials and Structural System). The "organizational form" or overall scheme controlling the position of all materials, dimensions, and inter-relationships of spaces is the form which is perhaps most critical yet the most influenced and controlled by the architect. Its component forms include "fixed form:", "permanent form", and "moveable form".*

"Fixed form" connotes the stationary, structural elements of the building. We can call it "non-tractable", because it is usually made of the heaviest, most indestructable material, is integrated with utility systems, and requires expert help and advice to change. Usually, it is easier to scrap the entire building than it is to make major mod-

ifications to the fixed form.

"Permanent form", on the other hand, is "relatively tractable" in that a "permanent" stud wall partition or a non-bearing masonry wall could be torn down or changed or added with a moderate amount of mess and inconvenience but without an expert's advice or structural damage.

"Operable form" includes those elements of a building that can be actively adjusted in place. These elements include doors, windows, shutters, and even folding walls. We will say that operable form is "highly tractable".

Furniture and portable equipment are examples of "moveable form". This type of form is the "most tractable", because it is easily relocated, added, or elimin-

ated.

All of these forms are present in almost every single-family dwelling in this country. They all contribute to a greater or lesser degree to the flexibility of the dwelling. There are also degrees of flexibility that the average inhabitant would like to demand of his dwelling. Long-term flexibility in terms of adaptations to the physical aspects of a dwelling is what we have been focusing on thus far. Yet most lifestyles today are demanding medium-term flexibility--the ability to accept temporary changes in life patterns (i.e. illness or week-end guests)--and short-term flexibility--the ability for change to accomodate various celebrations and social events (i.e.

holidays, dinner parties, weddings, etc.). These are situations that today's architect must anticipate and allow for, but by concentrating on the long-term flexibility issues, perhaps users will be encouraged to adapt their dwellings on a day-to-day basis once they are shown the possibilities available to them.

The possibilities are more abundant in a "loose-fit" concept of space. The idea is that if a majority of activities can be carried on in rooms of a certain rather limited range of sizes, more such rooms than actually needed ought to be supplied (over-provision). Choice is thereby improved.

In designing flexible, adaptable environments, over-

Initial design flexibility may be more important than spacial flexibility over time. The tendency of our culture is not to rearrange our environment to any great extent. The initial determination of our housing envelope and the knowledge that it can be changed at any future time is valued highly, even to the extent that people may be willing to pay higher rents than they may easily afford in order to obtain this flexibility.

Andrew Rabeneck

... to make as many possibilities for interpretation as possible, in the sense of giving each place its maximum 'capacity'.

Of essential importance here is that the differences are in fact qualitative, otherwise they all offer the same thing, and it will thus be only a question of pseudo-interpretation and a new stereotype pattern will be born.

*Herman
Hertzberger*

provision of space can be helpful, but over-provision of artifacts or built-in components that reduce the possibilities for change can be a real deterrent to participation.

An example of this over-design can be seen in most college dormitory rooms, which come complete with built-in bookshelves, desks, and even beds. The most frequent expression of dissatisfaction from occupants of these rooms concerns the lack of personalization possible when the furniture is "nailed down".

There is also a danger of providing excessive and inappropriate detail that inhibits re-interpretation of spaces. Placement of electrical outlets and lighting fixtures can turn spaces into one-use rooms. The standard

dining room with a central over-the-table light fixture is an example. Location of fireplaces and windows (high windows = privacies; average windows = living areas; low windows = circulation or entry) can also suggest and even limit the use of spaces. The idea is not to provide completely bland, ambiguous space but to choose carefully locations and types of details which do not limit the use of various spaces.

In summary, tractability, the "hands-on" manipulation capacity of a built environment is a one-word description of the possibilities provided for choice (adaptability) and change (flexibility). Several types of form may be employed in order to provide ways for inhabitants to reinterpret

In a changing world it seems reasonable to adapt a setting to his unique needs.

establish variety and flexibility as important goals in a building program. I do not propose substituting them for harmony, unity, balance, rhythm, excitement, or the other traditional design values. Both variety and flexibility inherently increase the range of individual choice. ... By variety I mean a multiplicity of settings and spaces a person can select to suit his individual needs. ... Flexibility is expressed in such terms as multipurpose, multiuse, and convertible spaces, ... It is closely tied in with personalization since it permits a person to

Robert Sommer

their environments. As long as the designer does not inhibit those interpretations by building in furniture or details which particularize spaces, a careful location of building elements and some degree of over-provision of space and services can greatly enhance the tractability of dwellings.

Investments

One of the objections to change is the kind of disruption it brings to one's life. If change means a period of dust, confusion, and loss of momentum, it is understandable why many people simply adjust themselves to their environments and tolerate cramped, unsuitable dwellings.

When considering the alternatives to major change, there is often a good deal of worry about living a perceptually temporized life with jerry-rigged, junky facilities.

The requirement then, is to not only change with ease but "to achieve a well-appointed and resolved solution-- Grace with Change."* In order to achieve this "graceful" change, the original designer

must forecast the amounts and kinds of efforts necessary to accomplish specific modifications.

It has been long recognized that space within building has "adaptive costs". These costs are higher the more rigidly designed the original structure. The idea of costs and a cost/benefit ratio is central to the concept of tractability. "A relatively tractable place is a physical place in which users can achieve a high degree of useful adaptation compared to the effort expended on adapting."* Put another way, tractability can be said to be "the ratio of benefit to cost in increasing choice by changing a place."*

*Sprague, *op. cit.*, p.13

*Robert Propost, *The Office-A Facility Based on Change*, 33.

*Sprague, *op. cit.*

There are a number of factors which combine to define the cost side of the tractability ratio. The factors are influenced by skills (social and technical) as well as by financial resources of users.

"Negotiation effort" is perhaps the most prohibitive factor since if a proposed change requires extensive cooperation of neighbors or a redefinition of legal ownership boundaries, the project may be abandoned before it has begun. Social skills and often legal expertise are called for. Many possibilities for change are ignored or overlooked due to the perceived inflexibility of property rights, legal definitions, and economic negotiations all related to bureaucratic

hassles.

Another factor, "shut down time" in terms of a truncation of on-going activities and an accommodation of life patterns to avoid the mess associated with change can significantly add to the "cost" of building adaptation.

"Technical demand" categorizes the factor dealing with skills required to accomplish a modification. It is in this area that the designer must be sensitive to what people can do with certain materials and what building skills they are likely to possess. The designer should, of course, choose materials that lend themselves to change. If the materials or structure of the building require alteration beyond the expertise of the unit's

dweller, negotiation effort must be relied upon to engage the help of relatives or friends or the services of tradespeople.

Which brings us to the final, but probably most important factor--"cost". The dollar value of materials and time (labor) is often the make-it-or-break-it factor when considering a change to one's environment.*

While these types of investments seem important blocks to the concept of tractability in dwellings, it must be remembered that they are only one side (the negative side) of the ratio of costs and benefits. The benefits in terms of congenial atmosphere, spaciousness, and personal control over one's environment are harder

to quantify and categorize but often outweigh the costs. As testimony--the many renovations to houses all across the country.

The task of a designer in today's housing market should be to increase the tractability of new housing. In order to tip the ratio toward the benefits side, prior thought about materials, space organization, and amount and size of spaces can provide the original building with less "costly" opportunities for change.

A building is primarily a membrane for separating an often harsh environment from the inside, controlled environment. Changing that outside envelope costs money--as much or more than constructing a new house.* But

**Ibid., p.17.*

**Charles Wing, From the Walls In, 61.*

changing interior spaces, especially if anticipated by the designer, can be remarkably inexpensive.

Another relatively inexpensive way to achieve tractability is by providing an abundance of raw space. Space can be interpreted in many ways and can add little to the overall costs of a building. Once the foundations are built, the electrical wiring and plumbing supplied and routed, and the kitchen and bath fixtures bought and hooked up, the remainder of the dwelling is relatively inexpensive.

Therefore, smaller units are often more expensive per square foot than larger dwellings since the high cost of standard equipment must be distributed over less area.

Unfortunately, as Sam Davis points out in The Form of Housing, methods of financing housing have not followed this logic, but rather a simple cost per square foot formula. The result is that all housing space is expensive and therefore minimal provision of space is the norm. The "life cycle costs" of the building and its suitability for many generations of diverse users are ignored.*

The present failures do not destroy the validity of the point, however. Space, in the long term is the best buy in terms of the potential for highly tractable environments. As Andrew Rabeneck points out--"Given a ten percent increase in space standards (about seven percent higher costs), considerable

**Sam Davis and others, The Form of Housing, 212.*

**Andrew Rabeneck and others,
"Housing: Flexibility/Adapt-
ability", Architectural
Digest (1974), 79.*

choice is possible using only conventional gadgetry (i.e. folding doors...)."*

All the space and gadgetry provided in an ideal tractable environment is a bad investment if the user remains unaware of the possibilities open to him. Education of the users is essential to achieving the end of a changing, long-living environment. In the case where a designer works with the future users in planning a dwelling, the system's advantages and manipulation possibilities can be brought to the user's attention. However, this situation happens only rarely (in participatory projects) and at most, only once in the life of the building (at its conception). The challenge to the designer thus becomes to leave clues

in the arrangement and placement of various building materials that will show many generations of inhabitants what the possibilities are. The building itself must become an educational tool.

In adaptable housing projects in Sweden and France, users who are initiated in the advantages of the sliding wall systems are very satisfied with their dwellings. They value the knowledge that they can change their homes with a minimum of effort and disruption as well as valuing the knowledge that if a decision proves inconvenient, it can be modified later.

It is this type of satisfaction that weighs heavily on the "benefit" side of the tractability ratio. The intangible knowledge of the

possibilities of changing and expanding can give a sense of security (won't have to move if lifestyle or family size changes) that can often out-balance all of the investments of negotiation, time, skill, and expense necessary in making changes. The designer's role is to minimize, in the original building, features that will hinder changes and cause investments to be higher than they need to be.

Guidelines , Standards, and Devices

Patterns

There are specific "moves" that an architect can make when designing a building which will make that building more flexible or adaptable and therefore more satisfactory to its occupants who can then have more control over their environment.

Many of these "moves" can be expressed in terms of "patterns" for proposed actions. These patterns can then be used as an optional catalogue of general principles, dimensional specifications, and specific building elements which can be employed to increase the adaptation possibilities of a building.

NOTE:

In the sense of cataloguing optional rules to follow for the purpose of increasing the "habitability" of an environment, the author is using the word "pattern" in a manner similar to the manner of Christopher Alexander in his book, A Pattern Language. However, the specific format of the "patterns" (which are here divided into three types - guidelines, standards, and devices) is significantly distinct from Alexander's "patterns", which are somewhat less physically specific and much better documented with observations and sociological data.

Guidelines

General notions which are used to set up fundamental organizations of territories and which are basic to an adaptable shared environment are defined as guidelines. These are, by nature, non-specific but generally applicable. They are perhaps the most fundamentally important "rules" to follow in designing a successful shared living environment.

Most of the reasoning behind these guidelines has been stated in earlier chapters dealing with the necessity for flexibility, over-provision of interpretable space, and minimization of built-in elements.

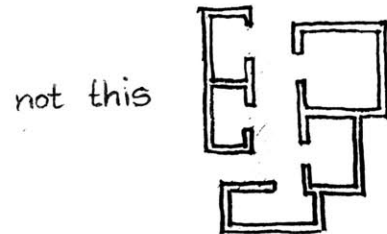
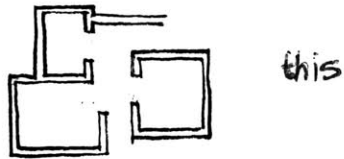
NOTE:

The list of guidelines presented here is in no way meant to be exhaustive. The author's intention was to present a few general topics for advice and further testing. Some of these ideas may prove to be too specific or actually incorrect when applied to a design example.

PROVIDE "SLACK" SPACE

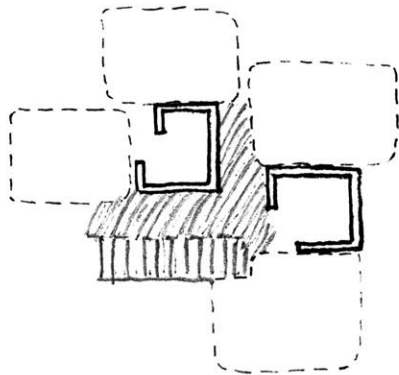
"Slack" or extra space for an overflow of activities and for storage should be designed into a congregate dwelling. The abundance of room in the interstices between spaces allows for flexibility and expansion of various activities. Inhabitants may use such "slack" space for extra storage area (for coats or bicycles), for bookshelves, for displaying collections, for a place for the telephone, or for any type of overflow that adjacent spaces may require.

Slack space may be "built-in" (as in Corbusier's Pessac housing) by providing an initial abundance of space or it may be evolved through changing space use or room redefinition with time (i.e. an extra room after the children leave home). The designer may not count on a convenient "evolution" of extra space, so an initial consideration of generous slack space is wise. Space is a relatively cheap commodity when compared with the cost of extra servicing, for example (see section on "Investments").



CENTRALIZE PRIMARY CIRCULATION

The design of a shared dwelling must be efficient in order for inhabitants to perceive the economic and social benefits of sharing with others. The design needs to minimize the amount of floor area devoted solely to circulation. Long public corridors should be avoided and space should instead be allocated to private use territories.



PUBLIC TERRITORIES DEFINED BY PRIVACIES

Let private territories such as bathrooms and sleeping territories, which need to be walled-off and closeable, define public areas and circulation paths. The "rocks in the sand" analogy illustrates the power of cell-like, unchanging spaces to shape the uses of the zones around them.

MINIMIZE "BUILT-IN" ELEMENTS

Built-in elements, such as lighting fixtures, closets, or furniture attached to walls, predetermine the function of rooms. By eliminating such elements, inhabitants are encouraged to manipulate furniture or reinterpret the function of rooms to gain more flexibility and a greater sense of control over their environments.

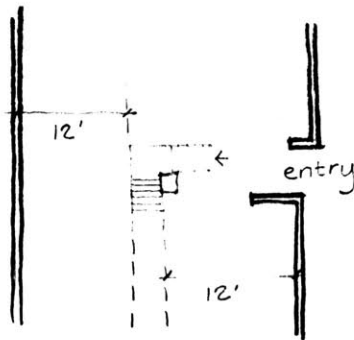
The guideline does not intend that neutral or un-designed spaces should be encouraged. It merely suggests that as few restrictions on room function as possible be determined by the original design of the building. The designer's task is to properly dimension spaces to accommodate more than one function and to concentrate his or her efforts on the correct positions and relationships of spaces.

PROVIDE TWO MEANS OF EGRESS

Fire codes for multiple-family dwellings necessitate two stair systems which reach the ground and which can be easily accessed from each possible sub-unit in the building. An inhabitant must not be required to pass through another's interior area to gain access to either of the means of egress.

Since in an adaptable building portions of the public circulation can be occasionally claimed as part of a private area, disincentives for such spatial "borrowing" should be evident for the portions of public circulation that connect to means of egress.

KEEP PRIMARY VERTICAL CIRCULATION FROM EDGE



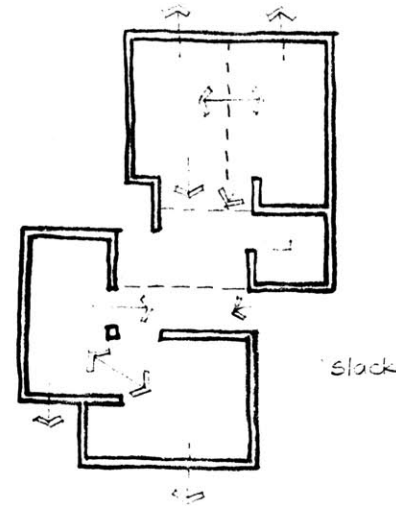
The main stair system should be located in the middle of the building where it does not block light nor hinder possibilities for expansion of territories. The dimension between the vertical circulation core and the exterior edge of the building should be at least the width of a large activity setting (or about 12 feet).

PROVIDE POSSIBILITIES FOR GROWTH

All fairly large spaces should have at least two ways in which to expand. Spaces can expand into "slack" space, circulation zones, other spaces, or into exterior space. In order to allow interior spaces to expand into one another, spaces should be large enough to be subdivided into two separate rooms.

PROVIDE UTILITY STACKS

In order to minimize intractable, interior "wet walls", cores of about 9 square feet should be provided to carry utilities (i.e. plumbing, heating ducts, electrical wiring, telephone wiring, and vents) vertically to all major floor levels of the building. Means for horizontal distribution of services in several directions at each floor level should also be provided to increase the range of possible locations of bathrooms and kitchens. Electric wires and telephone wires can extend quite a distance from these stacks but must never be concealed inside walls or interior partitions. This would encumber relocation of walls and hinder easy repair.



Standards

From the generally outlined ideas of the guidelines, some design standards or suggestions for deploying built elements in space were developed. While the standards are intended to be more specific than the guidelines, it should be remembered that they are only suggested ways to achieve adaptation possibilities and enrich the quality of shared environments.

The standards address issues of ways of arranging and dimensioning common building elements in order to achieve a greater range of optional uses for spaces. Dimensions are therefore proposed that will be tested and/or adjusted in a design example.

VARIETY OF SPACES

A variety of sizes and qualities of spaces should be provided in a shared environment in order to offer the inhabitants a choice of settings for different activities.

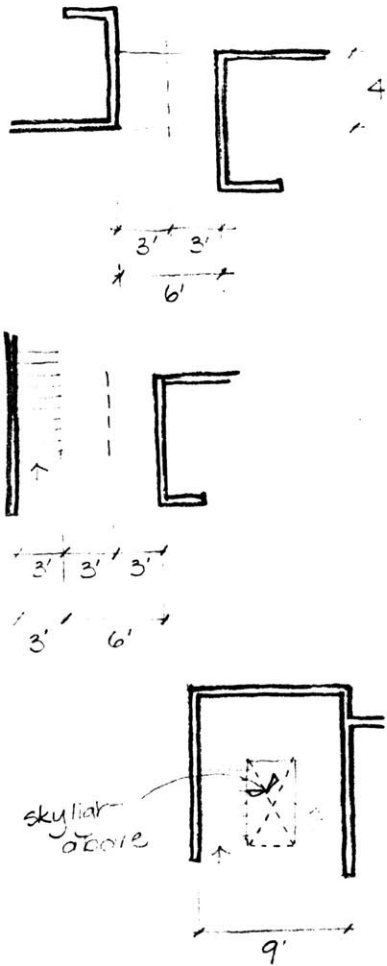
Size

- primary spaces - spaces capable of containing equipment and processes of people engaged in lounging, cooking, eating, sleeping (a large bedroom)
 - minimum dimension = 12'
 - maximum dimension = 20'
- secondary spaces - smaller spaces for uses found in small kitchens, breakfast areas, small bedrooms
 - minimum dimension = 9'
 - maximum dimension = 12'
- tertiary spaces - spaces large enough to be walked into (i.e. pantries and bathrooms, but not closets)- at least 20 square feet
 - minimum dimension = 9'
 - maximum dimension = 12'

Qualities

- light and dark
- high ceilings and low ceilings
- enclosed and open

SUBDIVIDABLE CIRCULATION



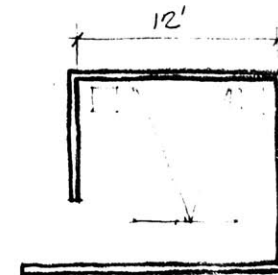
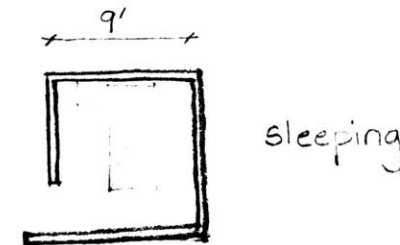
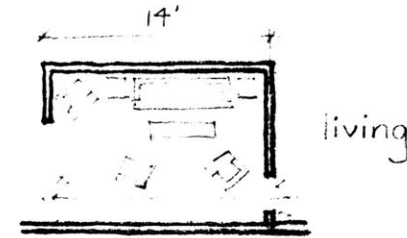
In a shared living environment, circulation space must be carefully dimensioned to allow multiple paths to be independently defined if the building is to allow for the possibility of subdividing into separate, autonomous sub-units.

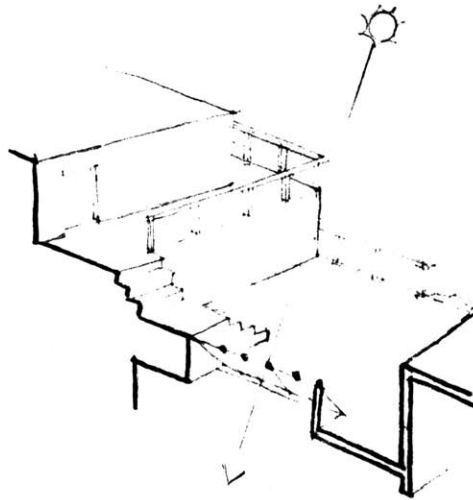
- A circulation path should be a minimum of 6 feet wide, if it is defined "permanently" on either side for a run of 4 linear feet or more. This allows for subdivision into two 3 foot side corridors or for the option of using the 6 foot wide space as a tertiary space (i.e. a bathroom or slack space).
- When a stair comes down adjacent to (not perpendicular to) a circulation zone, 9 feet minimum should be left for subdivision of the adjacent corridor or for a tertiary space next to the stair.
- Leaving 9 feet for the width of a vertical circulation zone allows the possibility of a wide landing and the opportunity for a light well.

ADEQUATE AMOUNT OF FREE-WALL

In all primary and secondary spaces, some amount of the enclosing walls should remain free of interruptions such as windows, jogs, or doorways in order to give a place for the placement of furniture.

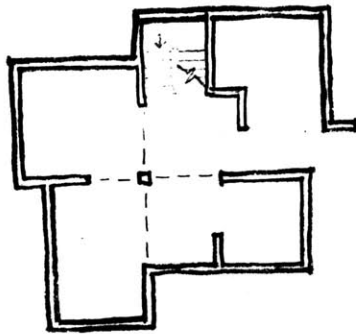
- living spaces - one wall should be at least 14 feet long to accomodate a sofa plus two end tables and a corner easy chair
- dining spaces - the wall nearest the kitchen should be about 8 feet long to provide space for a table, chairs, and access for serving
- sleeping spaces - for a single bed, a minimum of 9 feet; for a bed and night table or for a double bed, a minimum of 12 feet for a bed and two night tables.





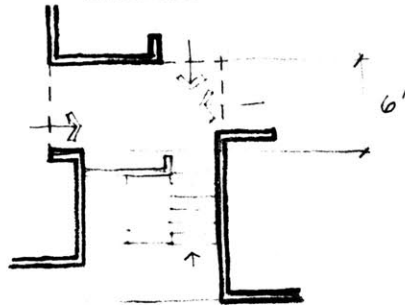
UPPER LEVEL COURTYARDS

Courtyards or open areas for exterior circulation at upper levels could allow access to autonomous upper level sub-units, provide a second means of egress, and make use of flat-roofed areas. Skylights could be provided in such courtyards which could provide interior spaces with light permitting a greater building depth with less exterior edge (a significant savings in building and heating costs).



VARIABLE LINKS TO CIRCULATION

Wide openings and possibilities for variable (i.e. "operable") links should be possible between spaces and "public" circulation zones. The center area of the building should thus be kept free of most "permanent" definition allowing inhabitants to actively modify the relationships of public and private use spaces to the common zones of the dwelling.



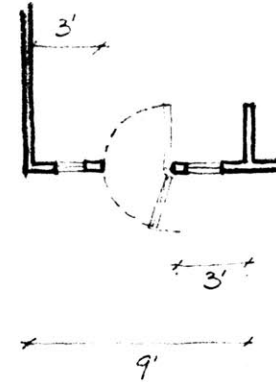
STAIRS TERMINATE IN CIRCULATION

Stairs should end in a cross-circulation zone on the upper level in order to minimize circulation space (no doubling back around stairwell). This arrangement would also allow the stair to be "shut-off" from surrounding spaces for use as a "public" stair or as a fire stair (a second means of egress).

SPACE FOR ENTRY

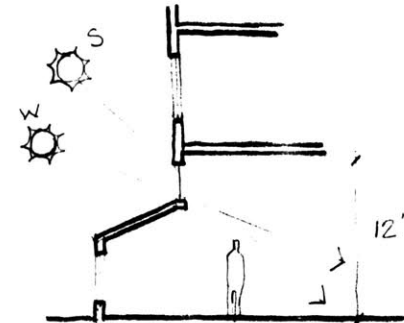
The entry to a shared dwelling must have a generous amount of space and an identity from the exterior, since a greater number of people than in a single family will be using it.

- A 9-foot zone should be left unobstructed for the entry both on the interior and on the exterior of the building.
- The door should be located in the middle of the 9-foot zone with at least one window on the side of the door for surveillance.
- Only one door should be evident on the building's exterior even if the building is subdivided inside.

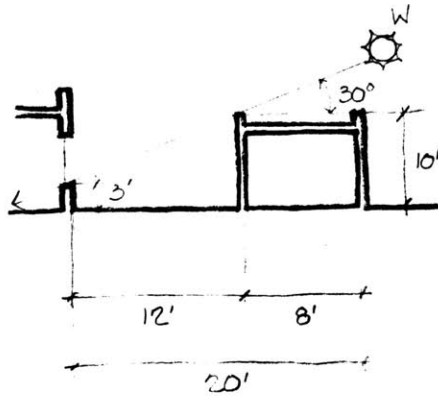


TALL GROUND-FLOOR SPACES

Some spaces at grade should have high ceilings in order to allow adjacent expansion at the building's exterior and still maintain light (but not view) into the center room. A height of 12 feet would allow the expanded area adequate headroom (without necessitating a level change) and still permit space for a clerestory to let light into the original room.



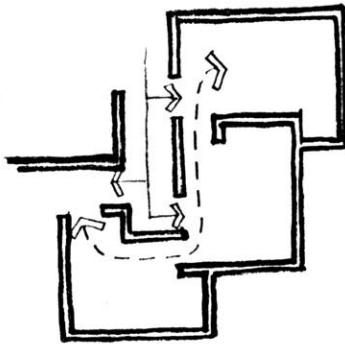
DISTANCE BETWEEN EDGE AND ADDITIONAL BUILDINGS



Small independent structures such as garages and workshops may be added around the building's perimeter but care must be taken as to restricting their heights and placement to insure that existing living areas inside the building still receive adequate light and ventilation.

- Leave a 20-foot minimum optionally built zone at the edges of the building
- A 12-foot zone closest to the building's edge must remain unbuilt in order to get winter sunlight over a 10-foot high, free-standing, enclosed structure.

SECONDARY CIRCULATION POSSIBILITIES

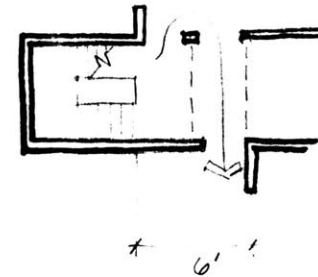


In shared dwellings inhabitants may wish to have the possibility of re-allocating space to different individuals. A second circulation zone parallel to but screened from the main circulation of the building could allow more than one space to be used as a single individual's territory. This secondary circulation option could also provide private access to bathrooms, shielded from the public view.

- Provide the possibility for openings between adjacent spaces near to the circulation zone of the building.

LARGE LANDINGS

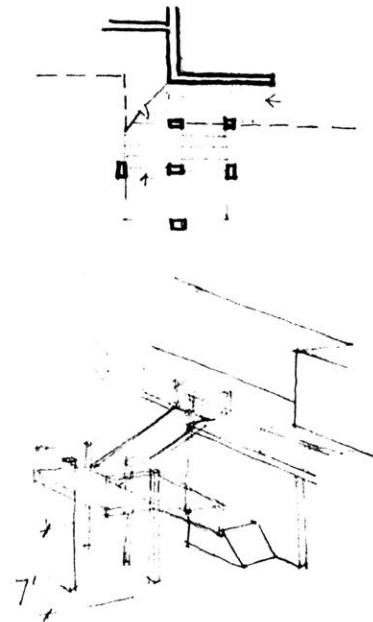
Stair landings should be a minimum of 6 feet in width when there are other spaces at the level of the landing. This would allow the landing to be divided to offer the opportunity of making the stair a "public" access and of creating autonomous sub-units. Also, by dividing the stair landing, territories on either side of the stairwell could be joined into a single sub-unit connected by a 3-foot zone of circulation.



EXTERIOR STAIRS

If stairs are located on the building's exterior, they should be perpendicular to the building edge to minimize loss of frontage which supplies light and expansion possibilities.

- The first flight of stairs should rise to a minimum of 7 feet above grade so that the space underneath can be used.
- An exterior stair should provide access to more than one territory above.
- Exterior stairs should be designed to be able to be enclosed at a later date. This implies that a starting position close to the building edge may be preferred.



Devices

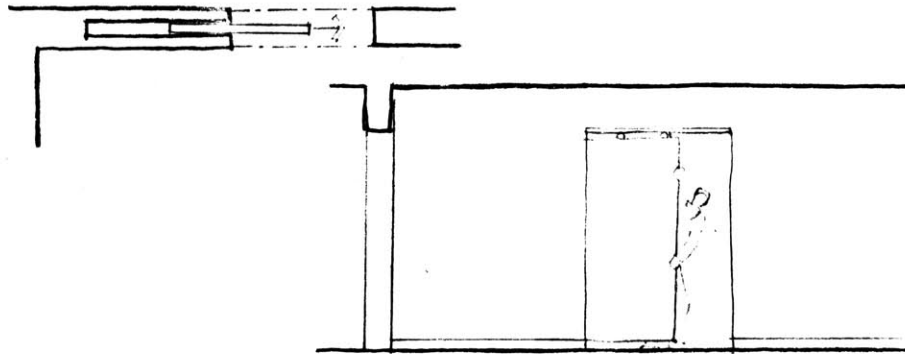
Operable equipment and building components are listed as devices which may be used as "hints" or easy answers to re-arrangement or re-interpretation of space within a shared dwelling. These devices are presented as a kind of "kit-of-parts" which may be combined, modified, or ignored by the designer.

The elements or devices listed here may not be included as part of the average residential building but they are not outside of the realm of standard building techniques and are all easily found or made from items on the current home-improvements or building construction markets.

Again, these devices are only put forward in order to try them and evaluate their effectiveness in a design example. Their merits and potentials for adaptability are briefly mentioned as accompaniment to the illustrations.

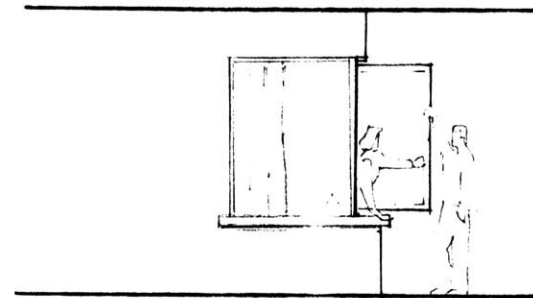
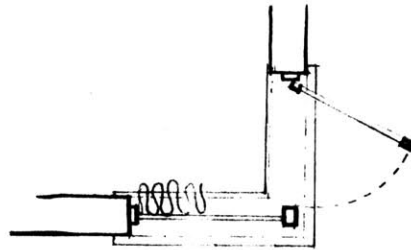
POCKET DOORS

- alterable on a day-to-day basis
- easy to operate
- can offer incremental degrees of closure
- not a terrific acoustic separator
- requires a lintel to slide along



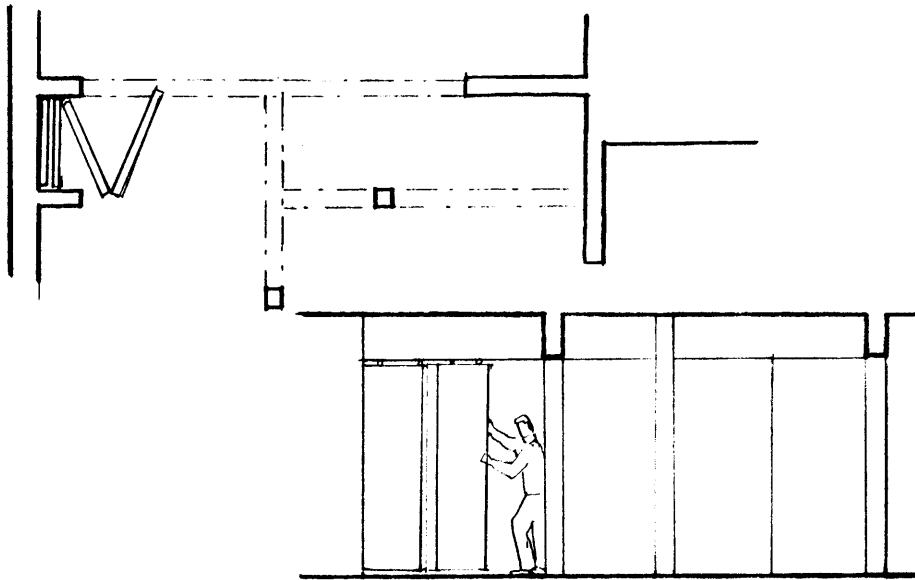
INTERIOR WINDOWS

- offers a new sense of spatial relationships
- can "borrow" light from other spaces
- curtains or shades can offer visual privacy (and in incremental degrees)
- operable windows can allow for total acoustic connection



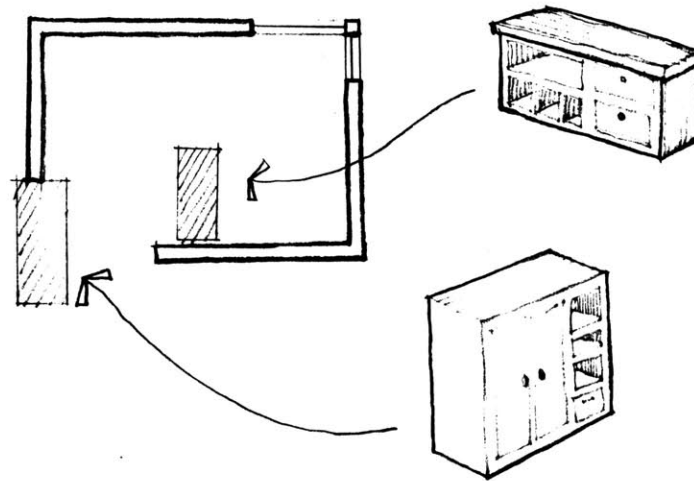
FOLDING WALLS

- easily moved
- incrementally used for partial containment
- some wall panels may contain doors
- not a lot of acoustic separation because there would be no seal at the bottom
- requires overhead lintel with tracks for sliding panels
- can be stored in small niches in walls when not in use
- can be hinged to form right angles for further space definition

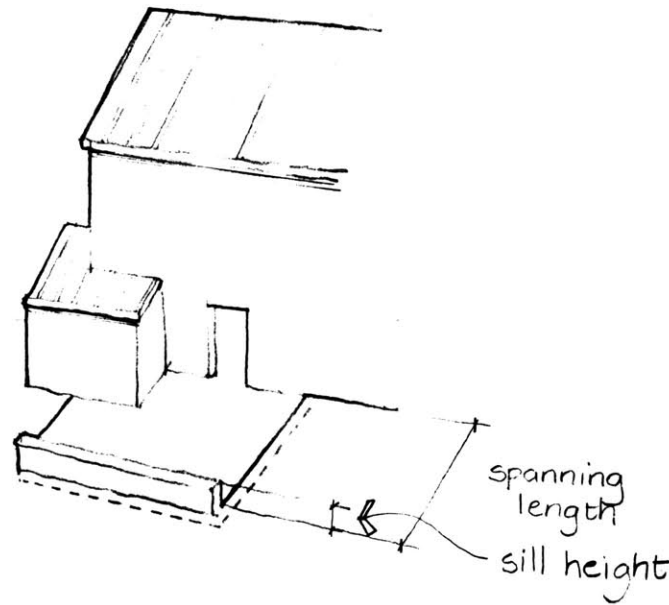


FREE-STANDING STORAGE UNITS

- easily moved (like large wardrobes)
- can be used to define space or provide sub-definitions within a space
- can take the place of built-in closets which rigidly define room functions
- not attached to finished flooring
- are available in a variety of sizes and capacities and are all sized to fit through doorways and under lintels



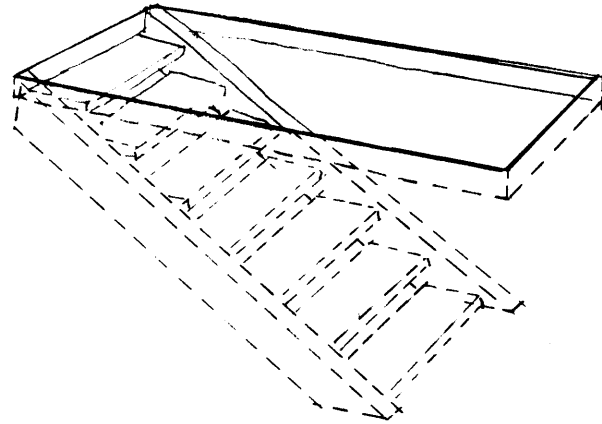
EXTERIOR SILLS

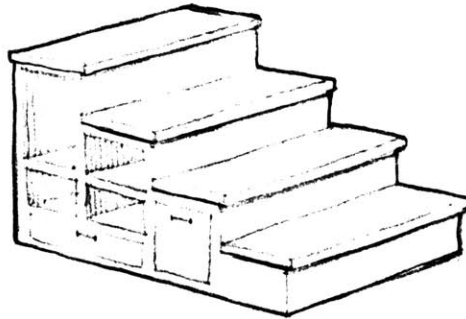


- extensions of foundations that can be built upon to produce additions to interior space
- use as low garden or patio walls until built upon
- height of sill should correspond with window sill height of first floor windows
- distance from exterior edge of the building dependent upon the spanning capabilities of the building's construction system
- location dependent upon interior opportunities for circulation to the building's edge

ATTIC "PULL-DOWN" STAIRS

- can be used as an optional vertical connection within a sub-unit (not as public circulation or a means of fire egress)
- requires special framing of particular portions of the floor to accommodate collapseable stairs
- easy to use
- can be made more permanent
- can be used to close off portions of space for heating efficiency (at night, for instance)

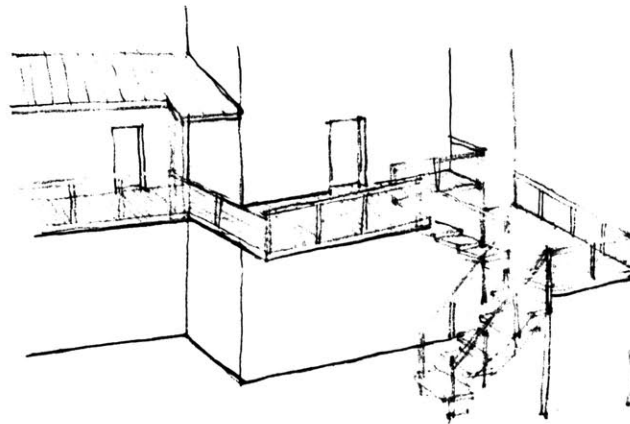




STORAGE STAIRS

- can be used as a moveable storage unit
- can be used to provide an optional, re-locatable connection between small changes in level (4 feet or less)
- can be used as open shelving

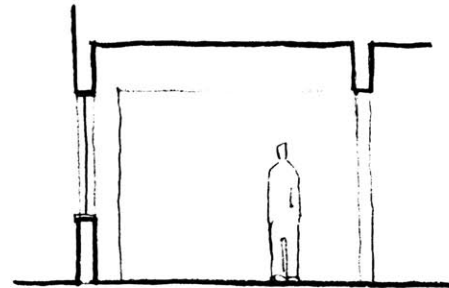
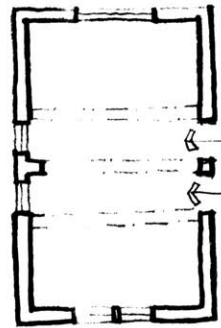
FIRE ESCAPES



- can provide small individual outside territories
- provides a second means of egress in case of fire
- doesn't block much light (because of its lightweight construction)
- can have the option of becoming enclosed
- can become a common upper level promenade for entrances to sub-units

OVERHEAD LINTELS

- indications of where permanent separations may be made
- provide tracks for folding walls and sliding pocket doors (as in traditional Japanese homes)
- can be located in line with structural columns to indicate possible closure positions
- the underside can be surfaced with wood to provide a nailing surface to facilitate the installing of partitions



The Design

The Design Process

NOTE:

While the author realizes that design is basically a creative process relying on much subconscious mental activity, an attempt to objectify this process has been made in order to clarify the nature of the inputs to this design problem and to in some way illustrate the process of evaluation and synthesis that normally takes place in the mind of the designer. Although the reader might find the following process description to be linear and therefore simplistic, the intent of the author is to try to preserve clarity. It is certainly recognized that design is a complex mental integration, fragmented and

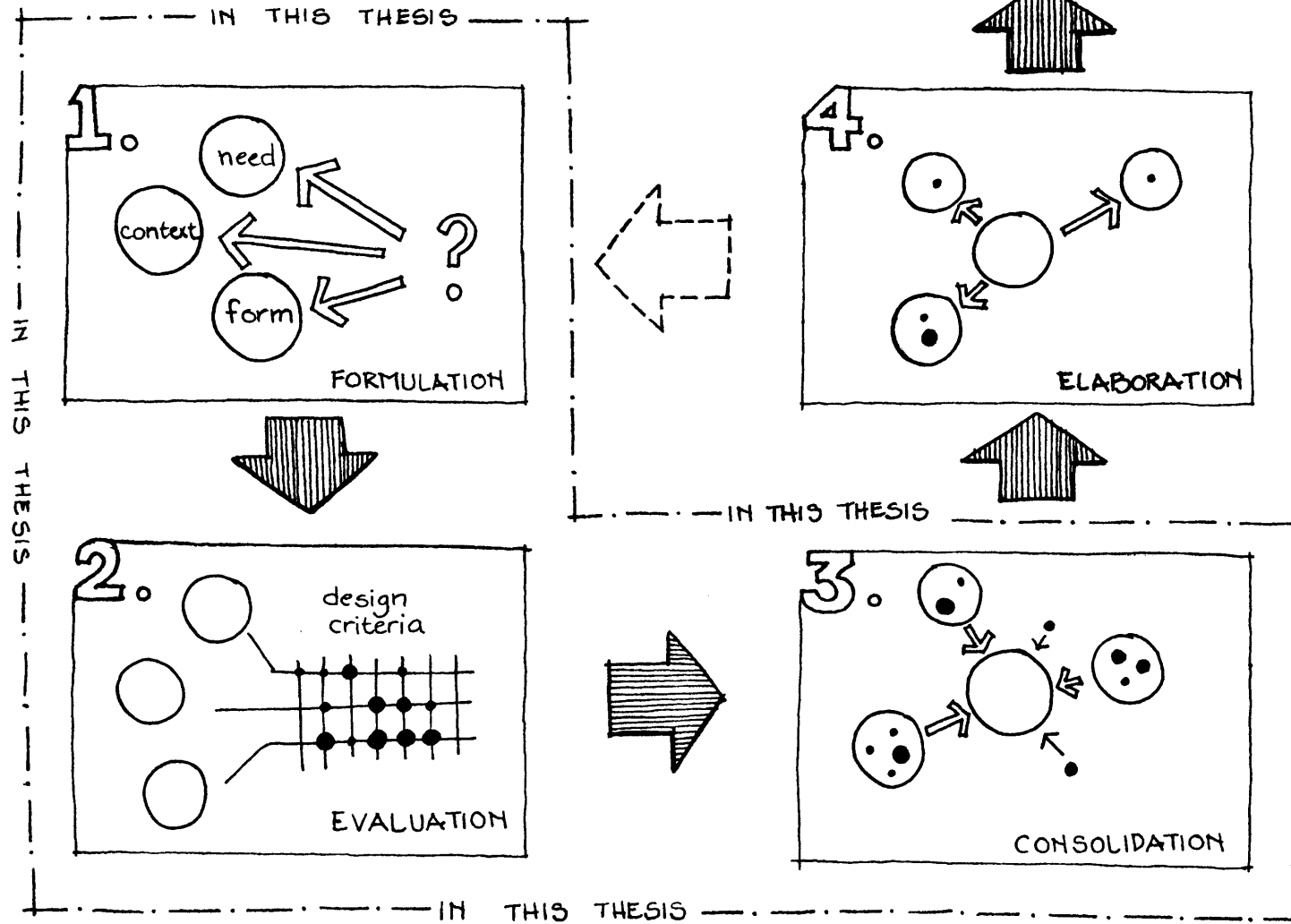
more spiraling in nature than linear.

The basic pattern of creative thinking seems to be composed of formulation (i.e. data gathering, discovering relationships, developing alternative solutions), evaluation of different formulations based on design criteria (i.e. determining the positive and negative aspects of each scheme formulated), consolidation of some of the good points of each scheme into one worthwhile preliminary design, and elaboration of aspects of the preliminary design resulting in the final design. The process is seldom straight forward and reiteration of many steps is often necessary.

Most designers do much, if not all, of this process in their heads using only scribbles and sketches to crystallize their intermediate thoughts.

Still, this model of the creative thought process can be useful as a way to picture for the reader the way in which ideas and observations found in the previous chapters have been used as inputs to formulation or as design criteria in evaluation. It is hoped that by elaborating this theory of design process, the reader will be more aware of and less confused about the origins of the preliminary design which will then be tested by a variety of inhabitations.

FINAL DESIGN



The elaboration phase will not be attempted in this thesis.

NOTE:

The design developed in this thesis is included only as an example or illustration of the guidelines, patterns and theories developed previously. It is not intended to be a "perfect solution" for the problems of communal living nor the "ideal building" for the proposed site. As such, it is left as a preliminary or schematic solution developed only so far as necessary for the inhabitations in order to facilitate evaluation and conclusions about the appropriateness of the guidelines and theories.

Formulation

The formulation of alternatives is perhaps the most difficult step in the design process. It requires not only gathering information and observations but also assigning priorities to various factors and uniting them all into semi-realistic design solutions.

There are many factors or variables to consider. It is sometimes useful to think of them in terms of three categories:

- 1) Performance variables:
desired characteristics for the overall design
- 2) Context variables:
factors not controlled by the designer
- 3) Design variables:

possibilities and choices available for implementation

We can simplify these categories and speak of Need, Context, and Form which correspond accordingly to program, site and building.

These three broad categories contain most of the important influencing factors that should be considered when formulating alternative design solutions. They all inform one another and should all be considered in a good alternative scheme.

Need

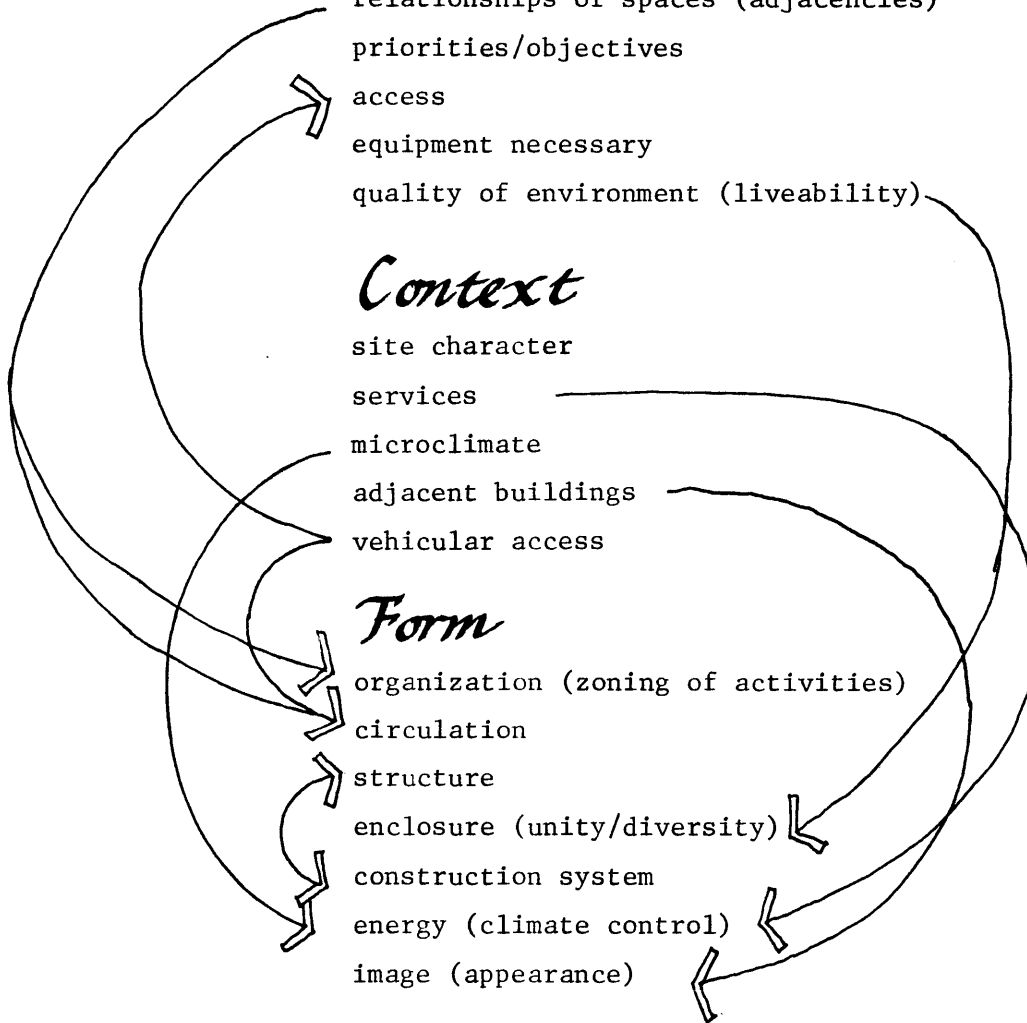
space requirements
relationships of spaces (adjacencies)
priorities/objectives
access
equipment necessary
quality of environment (liveability)

Context

site character
services
microclimate
adjacent buildings
vehicular access

Form

organization (zoning of activities)
circulation
structure
enclosure (unity/diversity)
construction system
energy (climate control)
image (appearance)



Need

In order to formulate alternatives, space and quality standards for both private and communal living areas must be made explicit. Using the information gathered from the interviews plus some of the author's own notions of appropriate quality or "liveability" of residential environments, descriptions of essential features and square footage requirements are developed. These will serve as a basis for a rudimentary program.

The relationships of various types of spaces are then explored. Of course, many kinds of spatial organizations are possible (see section on Form), but there are some fundamental adjacencies and iso-

lation requirements that are inherent in the nature and use of certain territories. These are presented in rough bubble diagram form.

Another way to investigate necessary qualities and relationships of spaces is to draw up a matrix of priorities and objectives, listing various spatial "qualities" and correlating each with specific territories. The aim is to get a detailed "program" or list of objectives inherent to the spaces (not specific to the particular users).

Space Requirements

Both private areas and shared zones of a congregate living environment have requirements unique to shared living as differentiated from similar areas in family living environments. The very nature of congregate living sets up particular problems with public/private interface zones, kitchens, storage, interior space, and many other aspects of daily life.

Private spaces within a congregate dwelling require more physical territory than bedrooms in a single-family house since they can serve as retreats used for a variety of activities besides sleeping. They may also be used as small apartments when equipped with either facilities for or ac-

cess to individual bathrooms and tiny kitchens.

Communal spaces require special attention and study too. Living or lounging territories are perceived as comfortable spaces within a certain range of sizes. More users does not necessarily mean simply increasing the size of such spaces. A study of how kitchens could be better designed for a number of simultaneous cooks is another task of the designer who anticipates communal living.

A number of special space requirements are specified and quantified under the two broad headings of "private spaces" and "common spaces". It is recognized

that there are many smaller, less quantifiable territories that are crucial to a good congregate dwelling and that they will be addressed and tested in the final design scheme.

*The house attempts to...
give form to the collec-
tive directions of the
people and provide
the stage for individ-
ual actions.*

Jan Wampler

Private Living Space

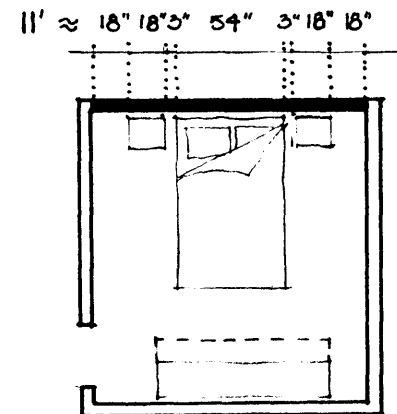
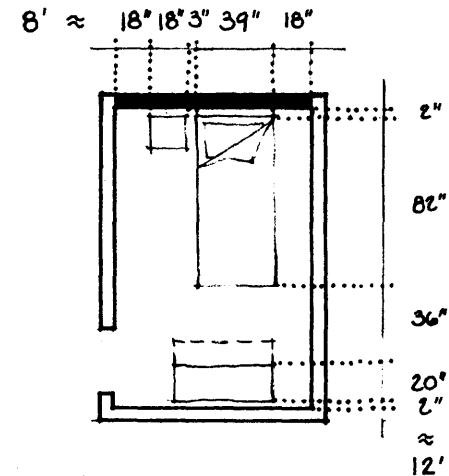
An individual in a congregate living situation needs more private territory than just a bedroom. In a family living situation, a small room for sleeping may be all that is necessary for a sense of autonomy and a place for retreat from others, since the family dwelling itself is considered a privacy from the larger community. Special privacy requirements can be foreseen for individuals sharing dwellings with non-family related people. The living group is seen as a smaller community within society at large. Extra private space is needed to foster a sense of "home" or "place" within the shared dwelling.

- Activities that should be possible within the private living space include:

- studying
- entertaining (individuals or small groups)
- discussing/conversing
- eating/snacking
- sleeping
- telephoning
- loving
- reading for pleasure
- writing letters
- pursuing hobbies

meditating
 listening to music
 exercising

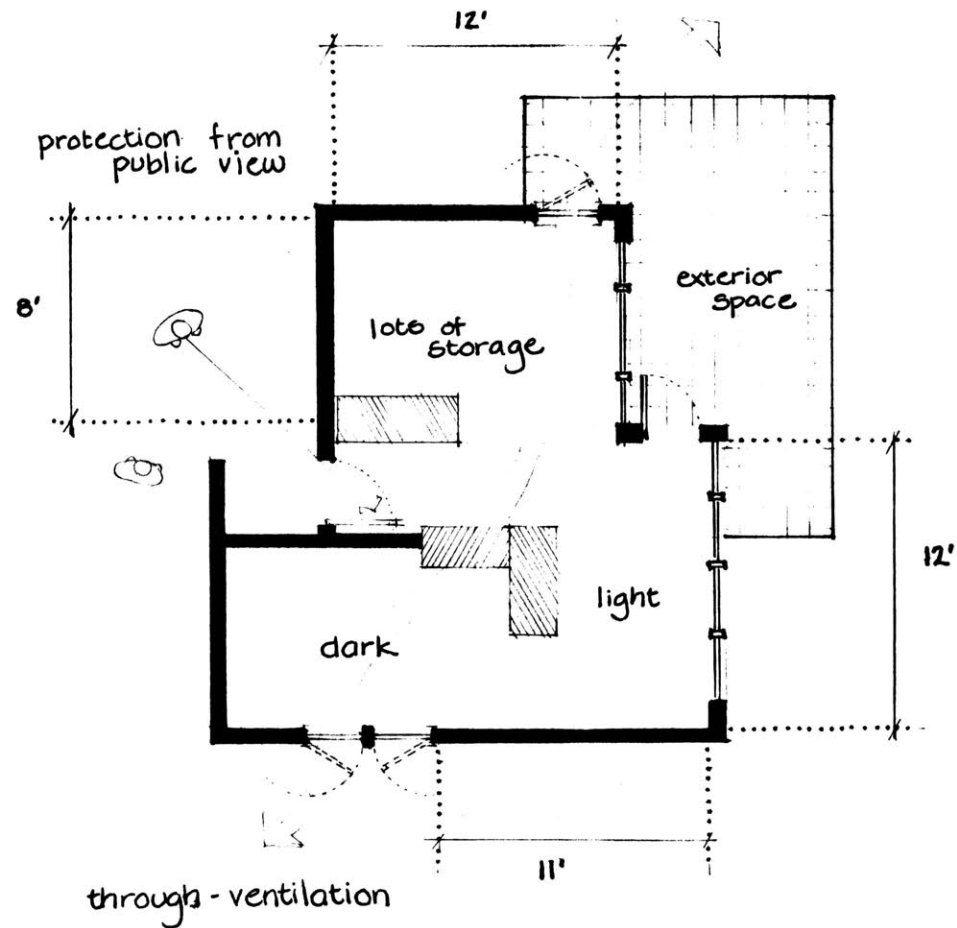
- Dimensions of free-wall (wall unobstructed by doors, jogs, or perpendicular walls) should be determined by the placement of typical furnishings. The range should be between 8 and 11 feet and this length of unobstructed wall should occur at least twice in one private living area to allow an option for furniture location.
- Area of the private living space should vary from about 300 square feet to around 450 square feet. Actual floor area may be less if the volume allows for lofts and volumetric interpretations of the space.
- Variety of qualitative aspects of various small activity settings is essential since the private living space can be seen as an independent domain in which choices should be maximized. A range of qualities such as:
 - dark/light
 - interior/exterior
 - enclosed/exposed
 - focused/spacious should be sought.



- A private living space requires through-ventilation without necessitating opening doors to public areas of the house. Summer breezes should be allowed to flow through the space without sacrificing acoustic or visual privacy. Every private living space therefore must have a minimum of two light edges (equipped with operable windows).
- Private living spaces require a lot of storage space because each individual is really a single-person household with many possessions. Bulky and infrequently used items may be stored in some common storage area (i.e. basement or attic) but an individual's space must provide room for:

<u>Item</u>	<u>Storage Need</u>
sports equipment	lots of space
collections/hobbies	display
musical instruments	special place
books	display
clothing	enclosed (drawers & hangers)
music systems/records	display
cosmetics/toiletries	enclosed

- Direct view from public areas or corridors should be screened or blocked from interior realms of private living spaces. A sense of personal domain and autonomy from the group cannot be perceived if the door to a private space is too well surveyed from a communal area.

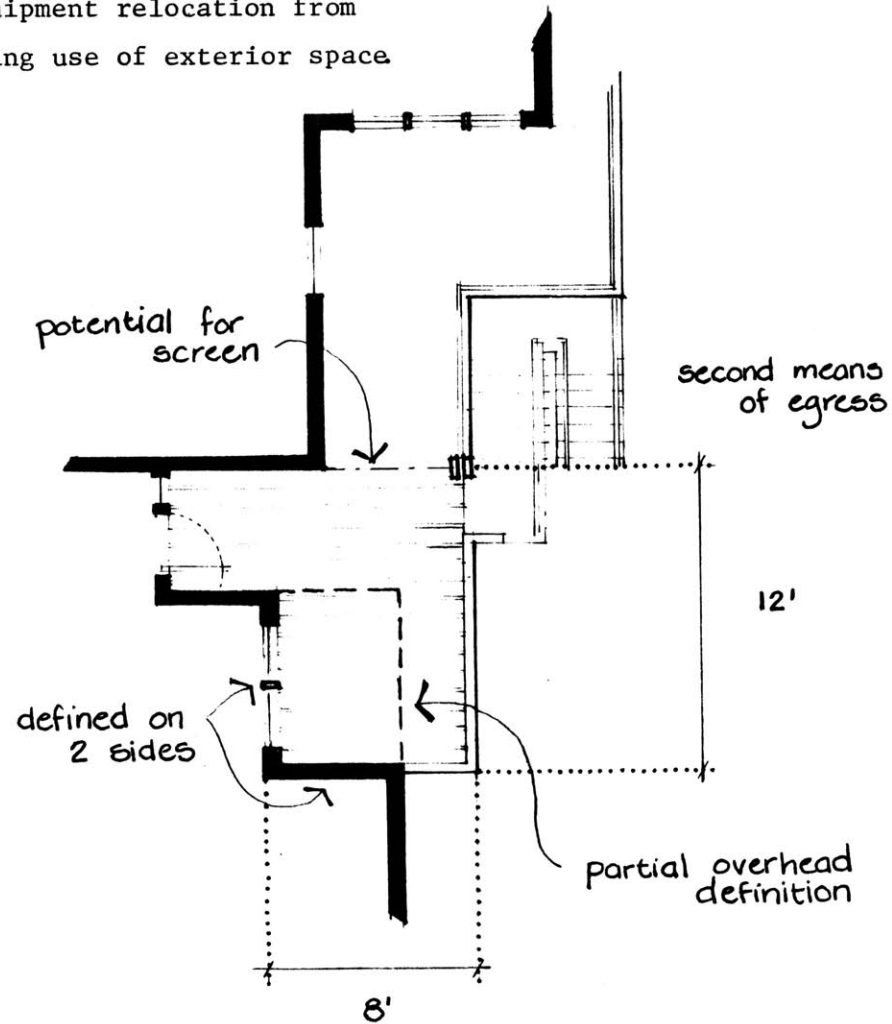


Exterior Private Space

The possibility for each private living space to have contact with an associated exterior space for the personal, private use of an individual is an important feature of a sensitively designed, shared house. The motives for communal living often stem from the compromise of economic constraints and a desire for a "private" home as opposed to an apartment. One of the important aspects of home ownership is the claiming of surrounding exterior space. A natural way to provide the "congregate dweller" with the same sense of buffering and claiming is to provide each private living area with an exterior private space - either as a small patio on grade or as a deck or balcony above.

- Activities that should be possible in such exterior spaces include:
 - eating
 - reading the paper
 - feeding birds
 - gardening (limited)
 - sunning
 - working on messy hobbies (furniture refinishing, paper mache, etc.)

- The exterior private space should be an extension of the interior private living area and should therefore be on the same level as the interior floor. This provides convenient furniture and equipment relocation from interior to exterior, thus promoting use of exterior space



- Dimensions of exterior private space may be small since larger exterior common spaces will also be available to the individual. A minimum space of 12 by 8 feet (or 96 square feet) is recommended. These dimensions should be at least partially defined by exterior walls of the building on at least 2 sides. Although the proximity to the building edge need not be along the entire length, the requirement of 2 sided definition should help to promote a sense of extension of interior space and avoid the "tacked-on balcony" type of exterior space.
- Part of the exterior private space should be covered (extending rooflines, overhanging upper floors, etc.) or at least partially covered (trellises, etc.) to provide for a range of sub-settings with variations of enclosure, shading, and weather protection.

Individual Kitchen

A tiny, personal food preparation area should be an option within a private living space. In shared living situations, often meals with many participants need to be supplemented with occasional individual meals to promote a sense of autonomy and because sometimes scheduling or chore allocation does not account for all the possibilities of guests, midnight snacks, special diets, or whatever. While it may be agreed that pooling of funds and effort may make group meals a wise policy in general, the individual should have the opportunity to make participation in group meals optional yet still eat at home.

- Uses for an individual kitchen include:
 - storage of individual favorite foods
 - midnight snacks
 - entertaining visitors
 - quick breakfasts
 - in case of illness
 - coffee or between-meal eating

- Equipment of the individual kitchen should not be "built-in" and limited to:

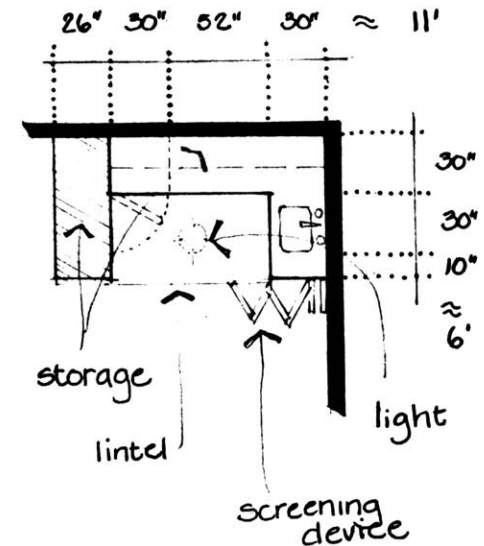
- an under-counter (small) refrigerator
- a micro-wave oven or toaster-oven
- a small sink
- a hotplate
- a fan (for ventilation and odor control)

- Dimensions of an individual kitchen should be based on equipment sizes and adequate counter space. A minimum size of around 6 by 11 feet (or 66 square feet) is recommended.

- Individual kitchens require some storage space for:

<u>Item</u>	<u>Storage Need</u>
garbage	under-counter (enclosed)
dishes/glassware	over-head or display
utensils	drawer
dry foods/condiments	exposed or enclosed

- Adequate light must be available although direct daylight is not absolutely necessary due to the temporary, infrequent nature of uses of the individual kitchen.



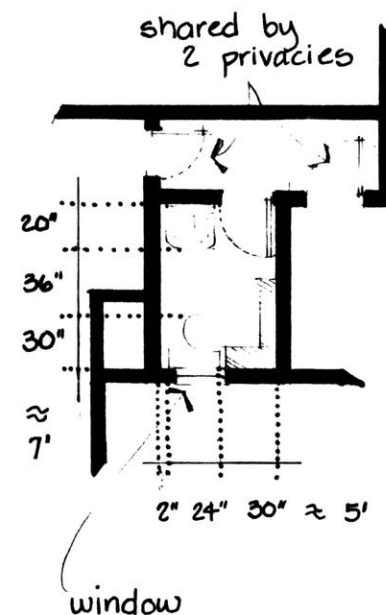
- The individual kitchen should have the optional possibility for closing itself off from view when not in use. Partial visual screening of dirty dishes in the sink should also be possible. The provision of an overhead lintel which could accommodate a curtain or folding partition might be a solution.
- The location of the individual kitchen should be close to the entry zone of the private living space in order to be able to accommodate grocery delivery and also to allow more than one (though not more than 2) private living spaces to share the individual kitchen.

Individual Bathroom

The individuals in a congregate house may experience more frustration and aggravation over sharing bathroom facilities than over any other communal facility. Even in a family, the prospect of waiting to use the bathroom prompts many homebuyers to rate the value of houses in terms of the number of bathrooms to bedrooms. The option for a "private" bathroom (or at least a half-bath) should be allowed, because the need will certainly arise in a household of independent adults with varying schedules and personal grooming habits. The bathroom, the most private of domestic spaces, is also seen as a

place of retreat and ultimate "aloneness". This aspect of an individual bathroom is significant for a person in a communal living situation.

- Uses for individual bathrooms can be varied and include:
 - a photographic darkroom
 - in case of illness
 - water source (watering plants, cleaning up spills, etc.)
 - personal care and grooming
- Dimensions for an individual bath may be small and are somewhat dictated by standard equipment sizes and circulation room. A rule-of-thumb minimum size is about 5 by 7 feet (or 35 square feet).
- An individual bathroom should have a window to the exterior for natural light and ventilation.
- Storage for an individual bathroom can be open shelves for towels and toiletries with some kind of closeable storage space for medicines.
- The individual bathroom should be located in such a way as to be out of direct view from circulation (both inside



of and outside of the private living space).

- Equipment for the individual bathroom should only include a sink, a mirror and a toilet. The toilet must be located within 4 feet of a utility stack and requires direct venting to the exterior. The sink may be located up to 10 feet away from a utility stack, however.
- The individual bathroom may be shared by more than one private living space (but not by more than 4 persons total). Location of individual bathrooms should be allowed where possibilities for dual circulation/access exists.
- An individual bathroom can be used as an acoustical buffer zone between two private living areas since it is likely to be not in use for a good portion of the time.

Shared Kitchen

The kitchen of a shared house is often the place around which communal life centers. It should have enough space for many people to cook, eat informally, and have conversations. Because a kitchen requires services and much equipment, location and size must be adequate for promoting efficient meal preparation. Extras such as a separate freezer, more counter-top preparation surface, and a pantry are all called for in a shared kitchen. The shared kitchen can also be seen as another "living space" within a shared dwelling.

- Activities that should be possible in a shared kitchen include:
 - preparing group meals
 - baking
 - eating snacks
 - playing cards
 - cleaning vegetables
 - conversing
 - preparing for parties
 - talking
- Dimensions should be generous and based upon standard equipment sizes (at least one wall should be a minimum of 11 feet long).

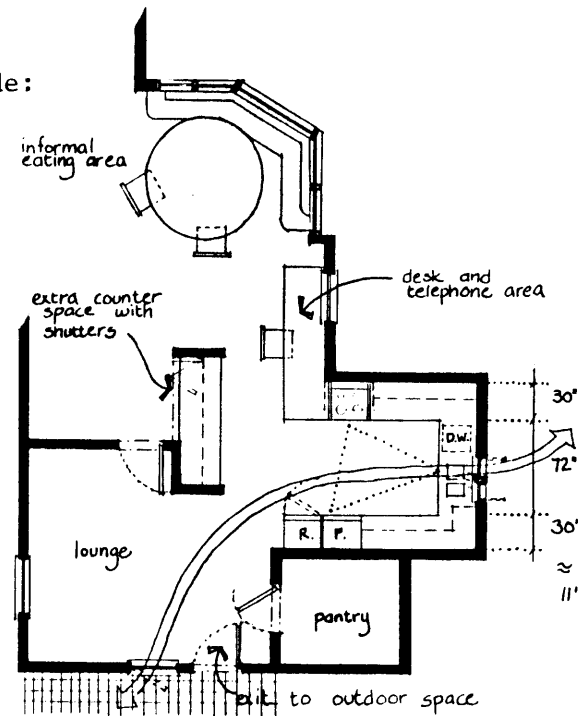
- To encourage efficiency in meal preparation, the kitchen should be arranged in a U-shape plan because the sequence of traffic is most often in a triangular pattern between refrigerator, sink, and stove.

- Equipment required in a shared kitchen should include:

- a refrigerator
- a double sink with a garbage disposal
- a stove top
- 2 ovens
- a dishwasher (close to sink)
- a separate freezer
- a cutting surface

- Storage needs of a shared kitchen are greater than those of a family kitchen due to the greater volume of foodstuffs.

<u>Item</u>	<u>Storage Need</u>
dry foods	pantry, over-counter
dishes/glassware	over-counter, open shelving
garbage	under-counter
brooms/cleaning supplies	separate closet, pantry
perishable foods	refrigerator, freezer



- A shared kitchen should be able to be closed off from other living spaces to mask noise and odors and the sight of dirty dishes in the sink. The possibility for visual screening is most important. Shutters or curtains could be used to separate the kitchen from the dining area for example.
- Natural light is essential in a large kitchen. Preferably two windows should be provided, one in each of two different walls to promote ventilation. A window above the kitchen sink for a view while doing dishes is nice.
- A shared kitchen should be located in close proximity to other areas such as:

<u>Area</u>	<u>Activity</u>
dining area	formal dinners, parties
outdoor patio or deck	outside eating, parties
informal eating area	breakfasts, snacks, coffee
access from exterior	deliveries, removing trash, feeding pets
garden	collecting vegetables

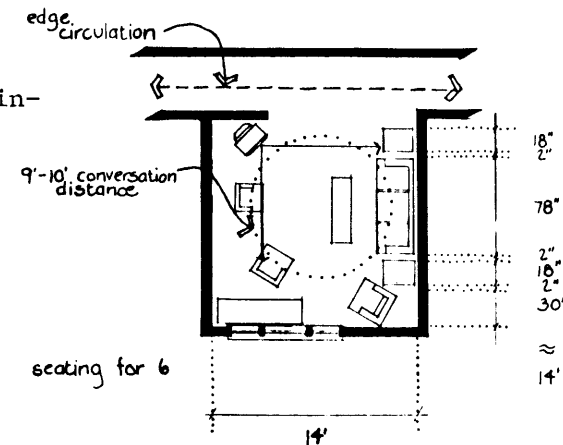
Group Living Space

"Living" or lounging spaces in a shared house need to be comfortable and properly located in order to be used, since residents may also have a small individual living space in which to carry on activities normally associated with a family room or den in a single family house. An increase in the amount of users does not mean a proportionate increase in the size of living space but may suggest an increase in the number of spaces devoted to "living room"-type activities. If the number of such spaces is increased a variety of qualities of spaces could be provided, giving inhabitants a choice of settings for various activities.

- Activities that may take place in group living space include:

- watching television
- entertaining guests
- conversations
- holiday celebrations
- group meetings

- Dimensions of group living spaces are influenced by furniture layout and on normal conversation distances (from 9' to 10').

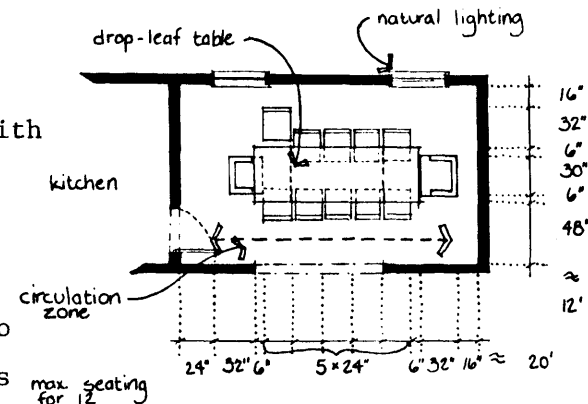


- Spaces should not be large simply because the number of individuals in the household is larger than in an average nuclear family. Group living spaces should accommodate around six people with additional seating provided by cushions on the floor. The average area of such a living space should be approximately 200 square feet. Furniture arrangement is, of course, optional but circulation should be along the edge and not directly through this space.
- A variety of qualities of group living spaces should be provided. Some rooms could be:
 - dark with a fireplace
 - light and sunny for summertime use
 - small and intimate for T.V. and games
 - large and public for parties or more active games

Group Eating Spaces

A variety of spaces devoted to eating should be provided in order to provide a choice of dining environments. A large group of individuals should have at least one indoor eating space where they may all sit down to a meal together. Meals are often a time to share with one another the events of the day and to conduct household business. Since dining space may not be in use a majority of the time (especially if the inhabitants have their own individual kitchens in their private living spaces), the space must be able to be rearranged or reinterpreted for other functions such as working, cooking, making crafts, or lounging.

- A dining room or a space for eating should be sized to accomodate all members or potential members of the household comfortably around one table. Twelve people seems to be the maximum possible number of people. Guests would have to squeeze in if all 12 household members were present. Perhaps a foldable table or a table with leaves could be employed to gain expansion of actual eating surface.
- A formal dining room should have good lighting but no centrally located light fixture which would limit its use to eating only.



- Dimensions for group eating space should be controlled by the size of the table and the normal dimensions required for access to chairs. These dimensions vary, of course, according to the amount of seating required by the group.
- An exterior patio or deck near to the kitchen may be used as a group eating space. Although one big table may not be necessary, enough dimension for outdoor parties and summer bar-be-que's should be provided. This option for outdoor eating is more necessary in shared living situation since large groups of people can then be entertained outside, weather permitting.
- A breakfast or snack area should be provided near to or as part of a shared kitchen. This area needs only to seat six people since it is intended to be used informally and never by all members of the household at one time. This space could also be a small group living space provided a table is supplied.

Common Entry

The entrance to a shared house must be spacious since the amount of people using it is large. It must be clearly distinguishable from the outside since there will also be a large number of guests and friends coming to a shared house. In the case of a common entry, bigger space and a bigger gesture is required because the household size is bigger than a single family household.

- The entry must be recognizable on the building's exterior and a clear, well-lighted path must be evident.

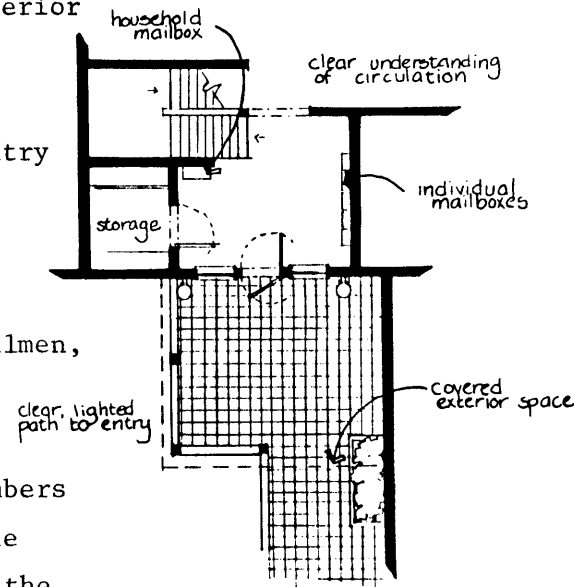
- Activities that should be accommodated by a common entry space include:

receiving guests

putting coats on and off

receiving deliveries by service people (i.e. mailmen, meter readers, paperboys, etc.)

- Many separate mailboxes for individual household members should be provided (to insure privacy) as well as one common household mailbox. Some indication of where the individual's territory is located within the building should be made on each mailbox as an aid to guests and friends.

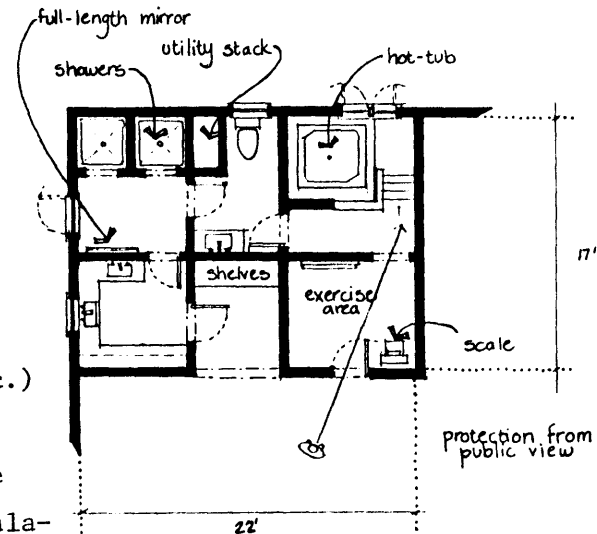


- A clear understanding of the principles of circulation and public/private organization of spaces should be possible upon entry.
- A common entry requires permanently located facilities for:
 - coats
 - boots
 - umbrellas
 - sports equipment
 - etc.

Shared Bathroom

In a shared dwelling, many so-called "private" activities may become shared. Certain facilities such as hot tubs can be common to the household in general whereas individual possession might be prohibitively expensive or spatially inefficient.

- Activities that may take place in a shared bathroom include:
 - bathing
 - showering
 - relaxing in a hot tub
 - exercising
 - bathing children
 - personal care and grooming
 - medical care (removing splinters, bandaging, etc.)
- Dimensions of a shared bathroom are dependent on the dimensions of various pieces of equipment plus circulation space and some extra space for exercising and lounging. An area of approximately 375 square feet is a minimum area.

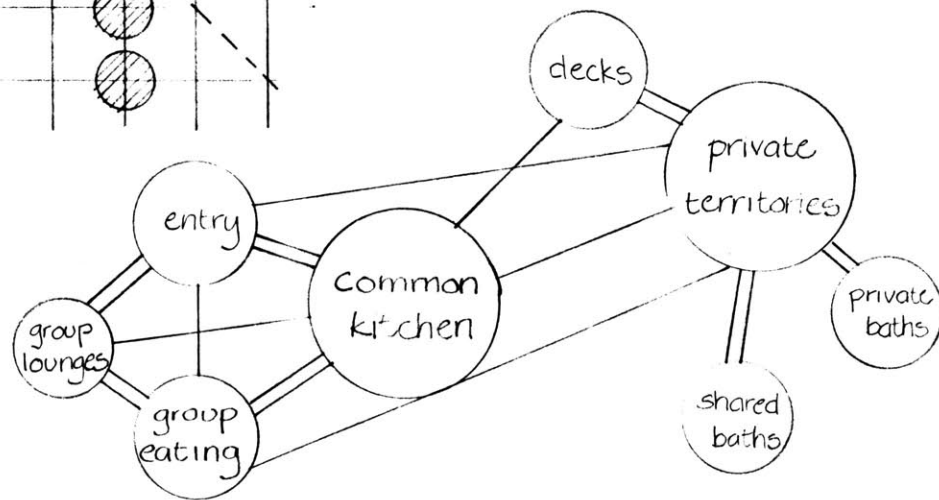
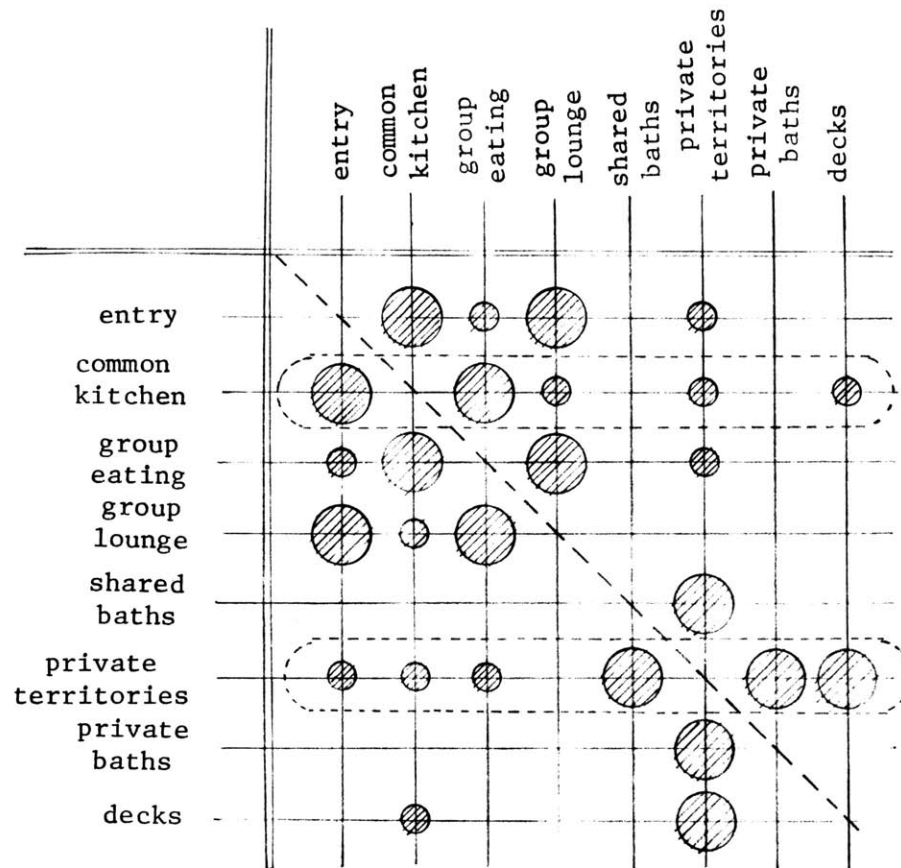


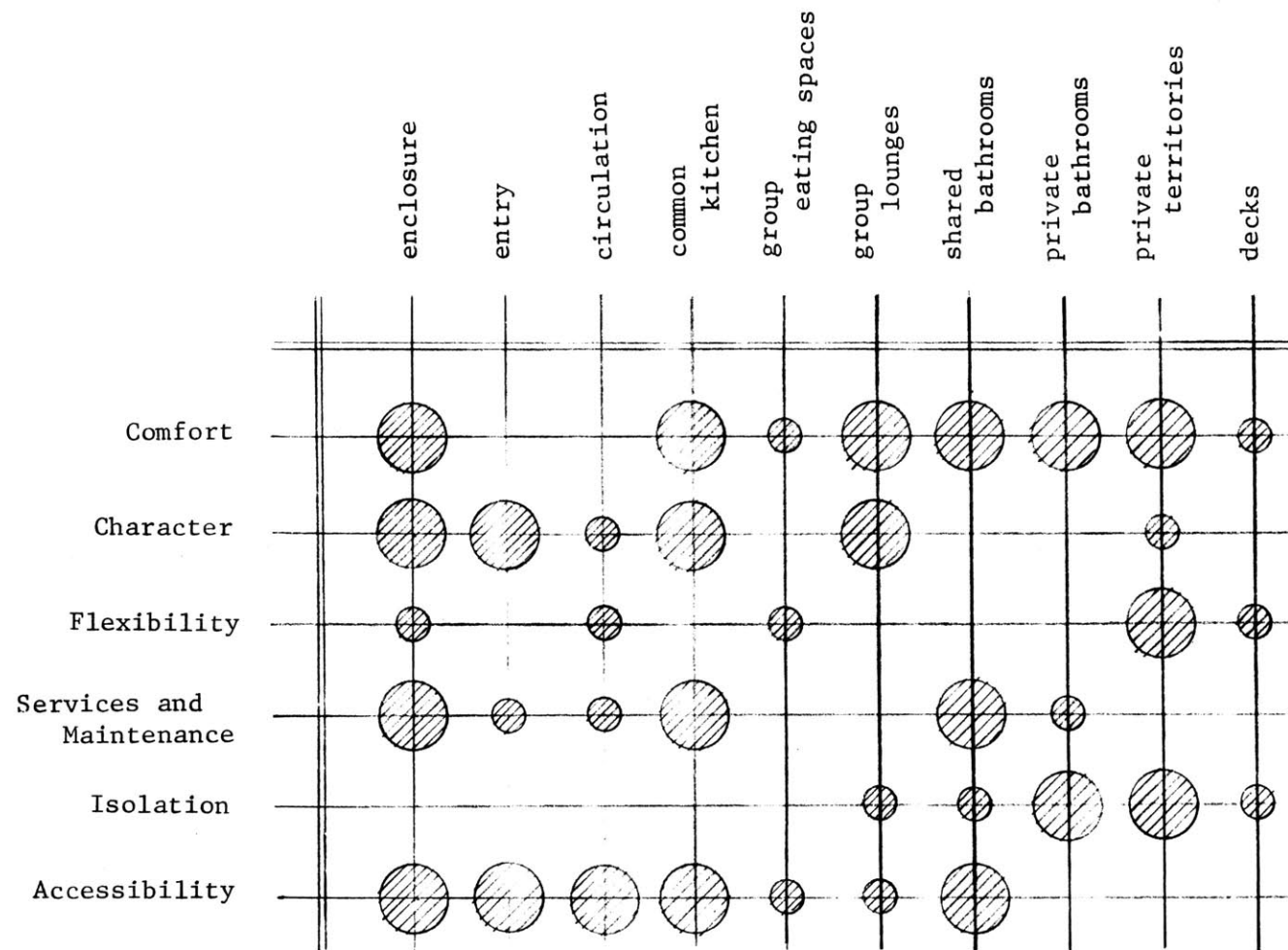
- A shared bathroom should be subdivideable with separate compartments for various pieces of equipment or groups of equipment. This would allow more than one person at a time to use the facilities.
- Equipment in a shared bathroom may include:
 - shower stalls
 - a bathtub
 - sinks
 - a full-length mirror
 - a W.C.
 - a scale
 - a hot tub
- Shared bathrooms need storage only for cleansers and first aid equipment as individuals must bring towels and personal care items with them from their private spaces.
- An indicator of the current use of the shared bathroom would be helpful in discouraging interruptions and privacy violations. A schedule of bathing habits would also be helpful outside a shared bathroom.
- Shared bathrooms should be located close to privacies so that individuals may have access to facilities

without going through public spaces or central circulation zones.

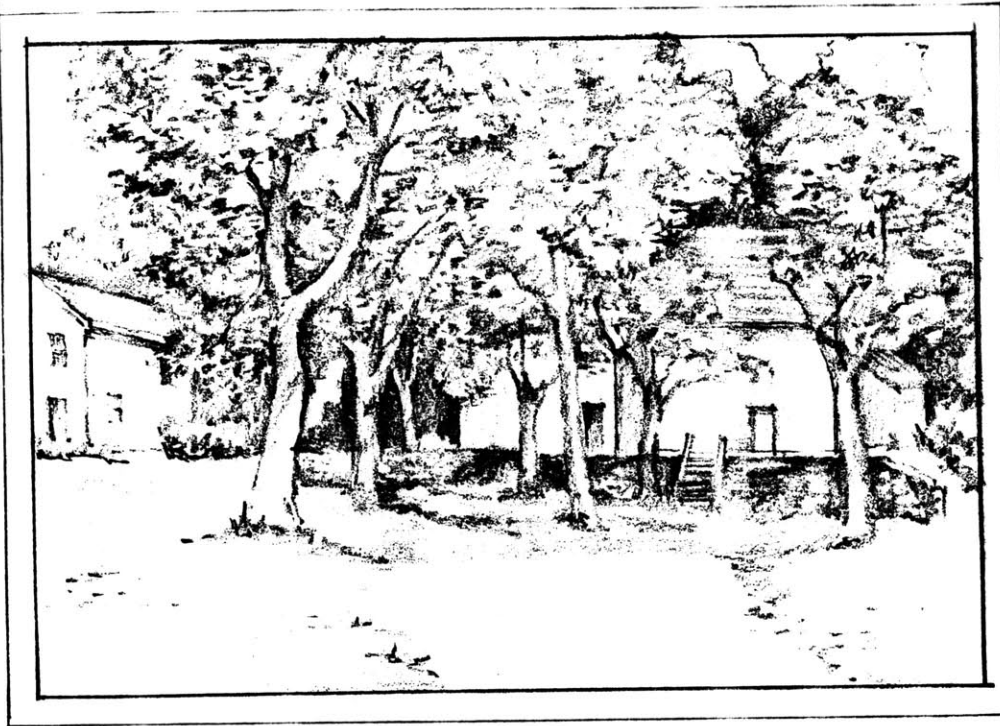
- At least one window to the outside must be provided in a shared bathroom for adequate ventilation and light.
- Shared bathrooms must be protected from direct public view. Space for facilities requiring most privacy (i.e. showers, W.C., etc.) should be screened from the doorway of the bathroom. Exercise areas and sinks can be viewed from the doorway of the bathroom if necessary.

Relationships of Spaces





Matrix of Objectives



Context

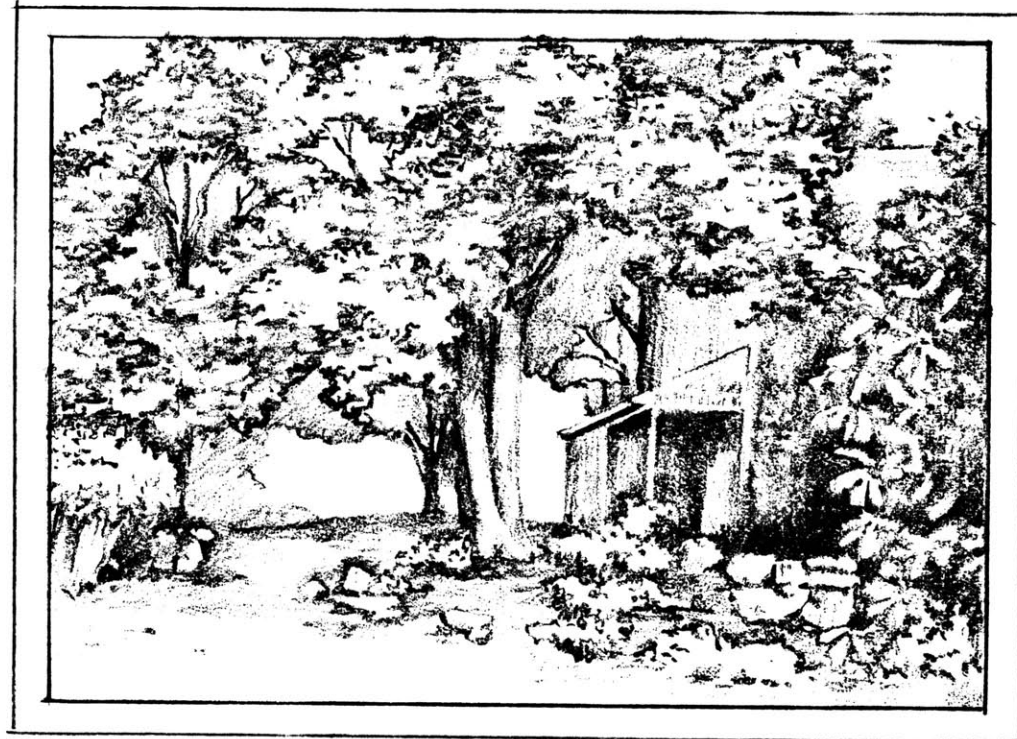
An examination of the particular aspects of the context for this design example is useful in order to set the boundaries for the design problem. Context places constraints on the number of reasonable design options. It helps focus attention to the really viable alternatives and keeps the designer "on course."

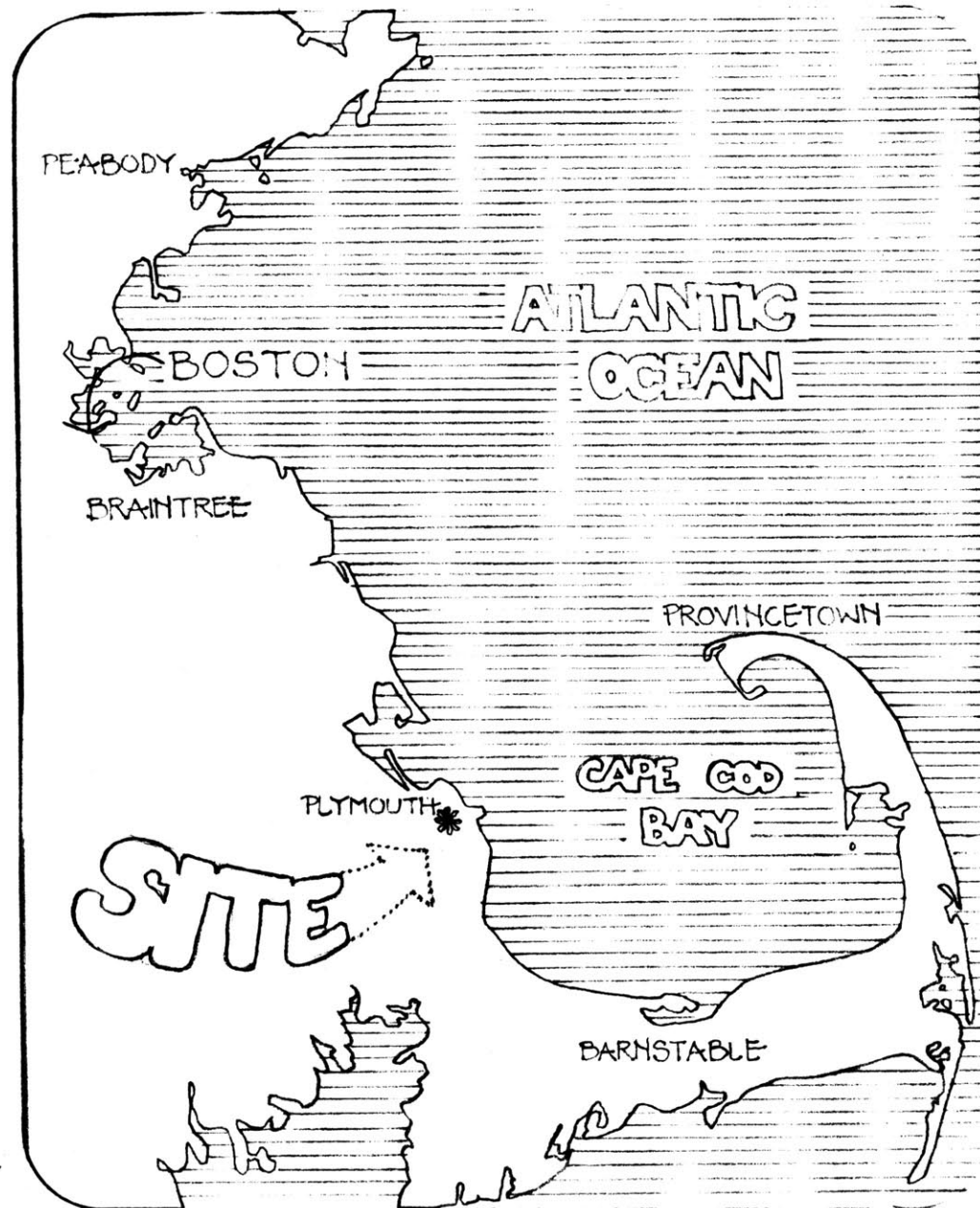
A description of the location and character of the site chosen for the design is presented. Rationale for site selection is also discussed.

Next a series of drawings analyzes features particular to the site which may influence siting decisions. The features of topography,

climate, landscape elements, access, and adjacencies and views are presented.

Decisions about siting and the reasoning behind them are explained. A potential development zone is outlined and presented in the form of a conceptual map.



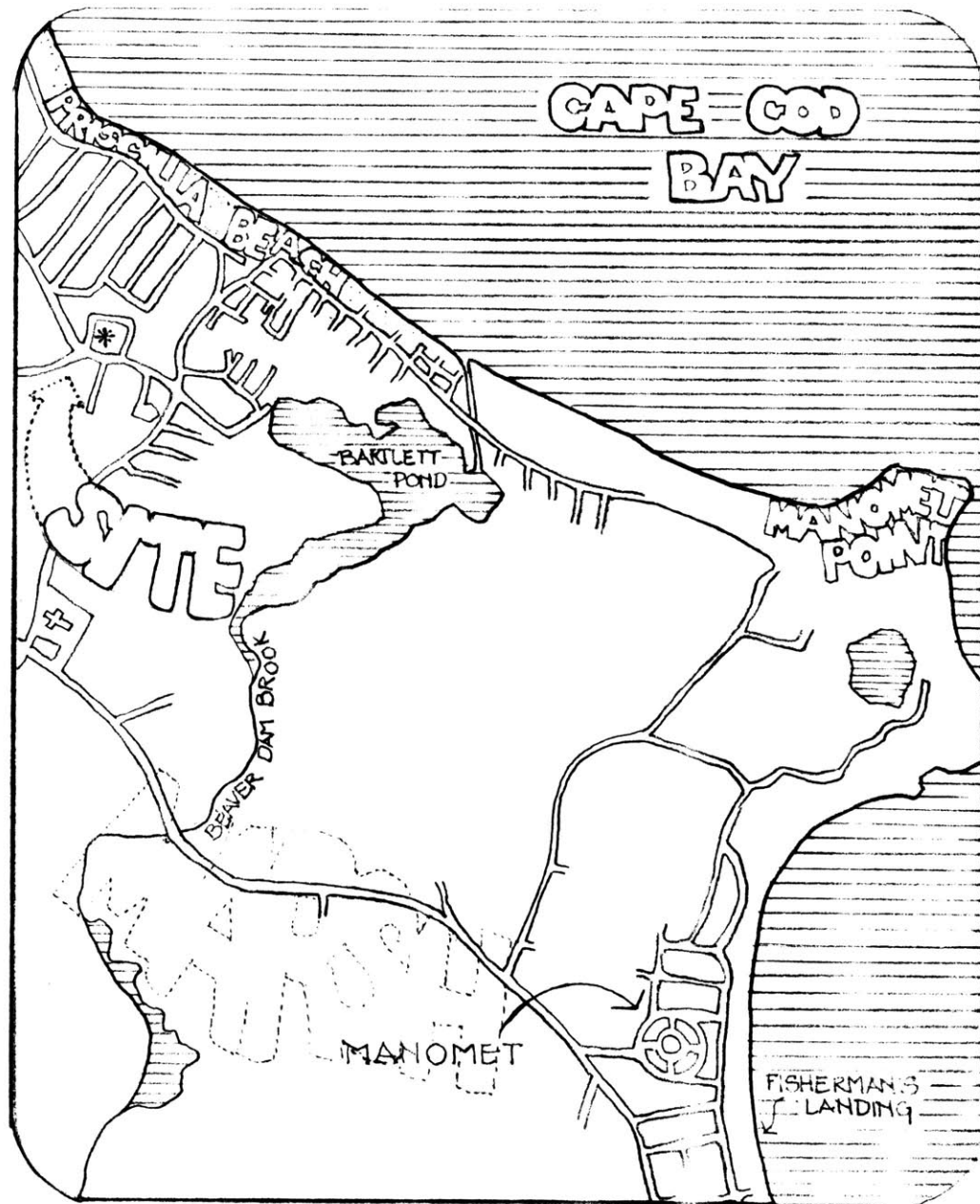


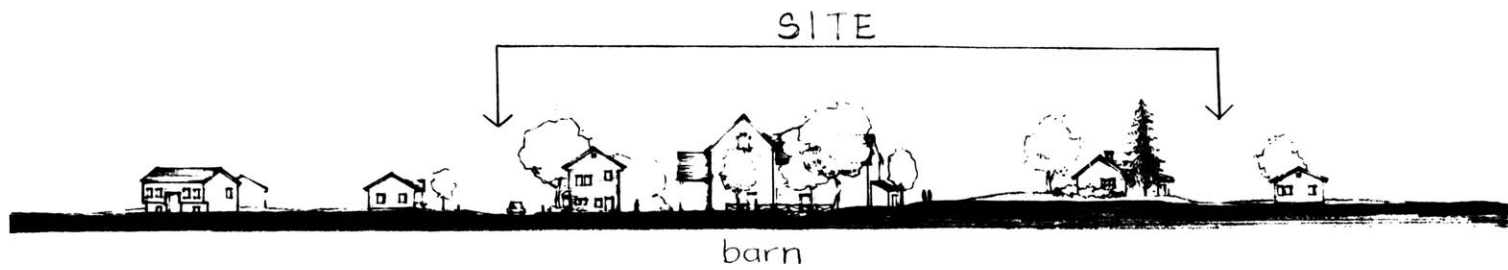
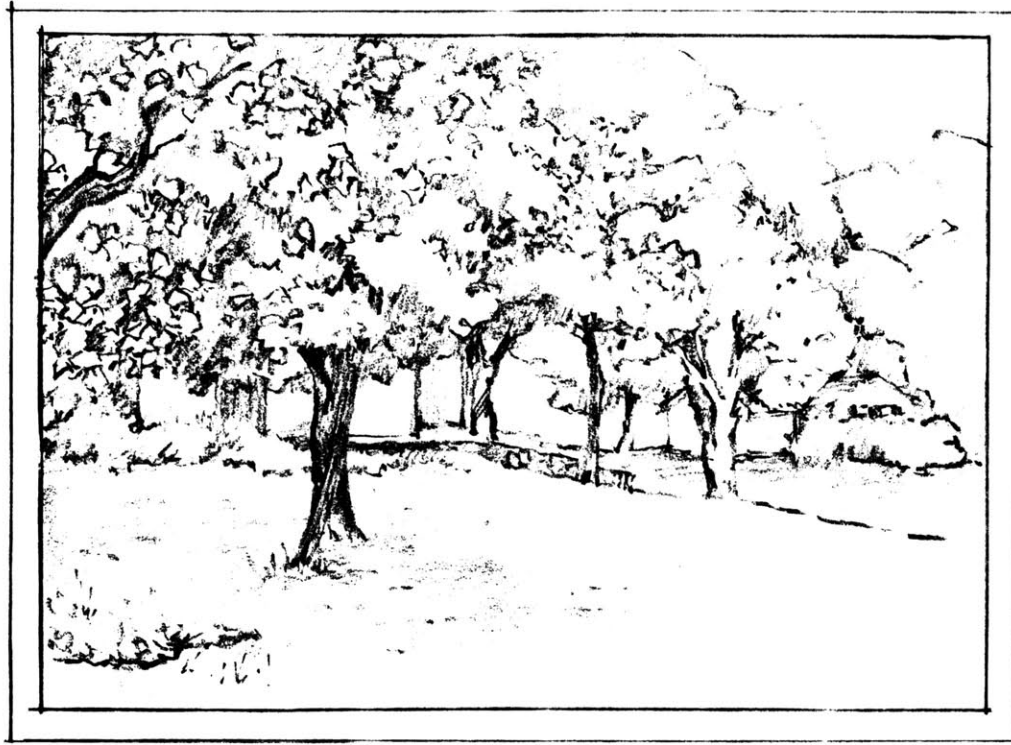
Site Description

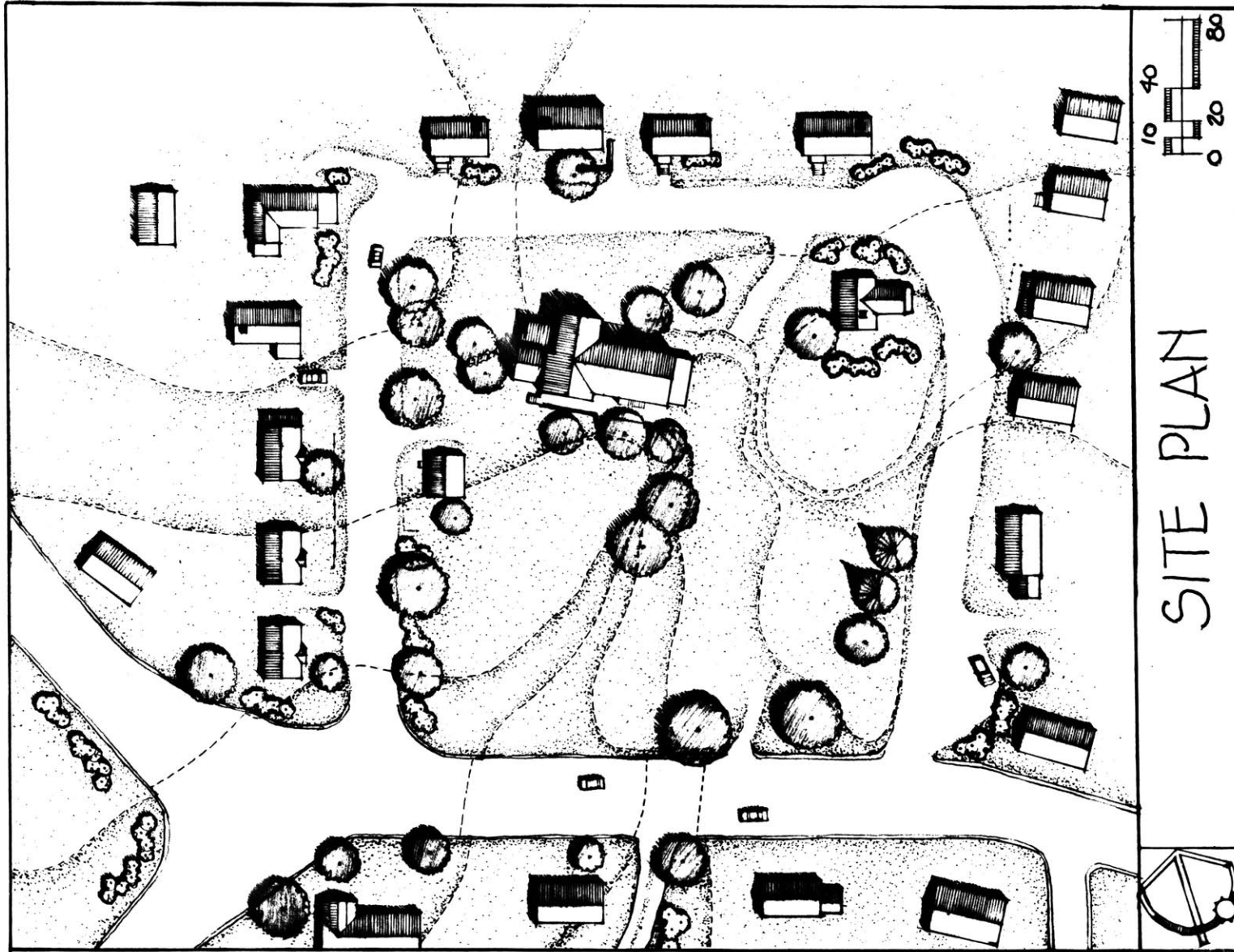
A non-urban parcel of land in Plymouth, Mass. was selected for the testing of the patterns and guidelines. It is located about forty miles south of Boston, just a few blocks inland from Cape Cod Bay. It is somewhat suburban in character, being on the outskirts of the small community of Manomet, Mass.

This type of site was preferred because the issues of density, climate, and neighborhood context are minimized. By playing down some of these variables, the central issues of communal living and adaptable structures can be explored to a greater extent. However, a virtually non-contextual rural site was

not deemed appropriate since the types of shared living groups presented require the stimulation and interaction of a wider community. Also, the issue of individual personal realms which can be identified on the exterior of the building is significant and should be explored in some type of built context.





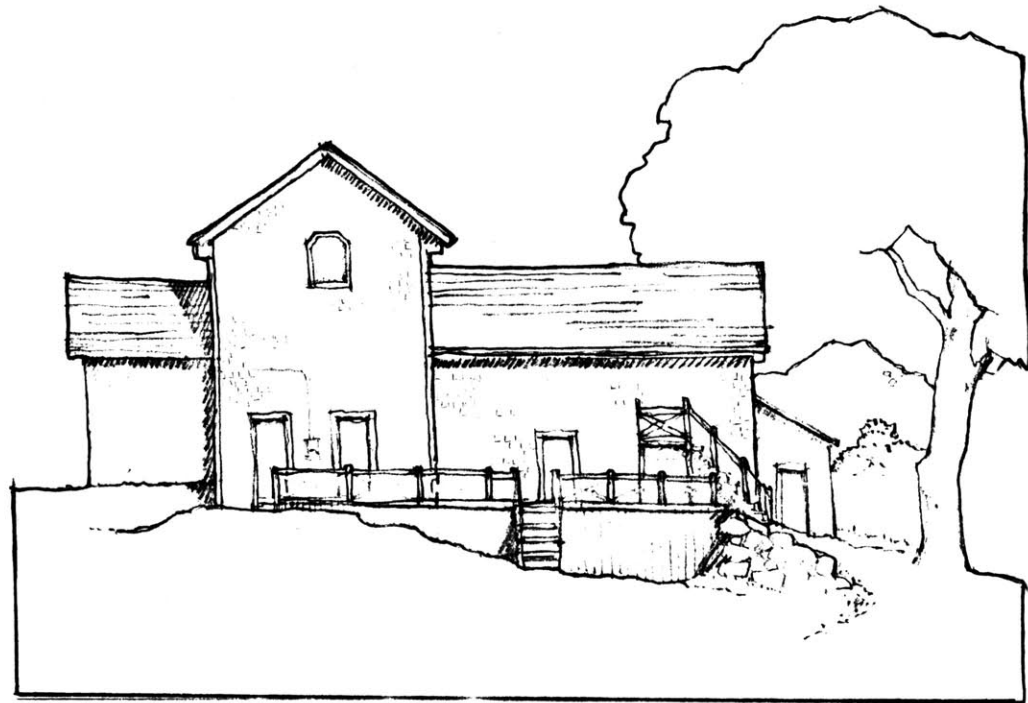


Site Analysis

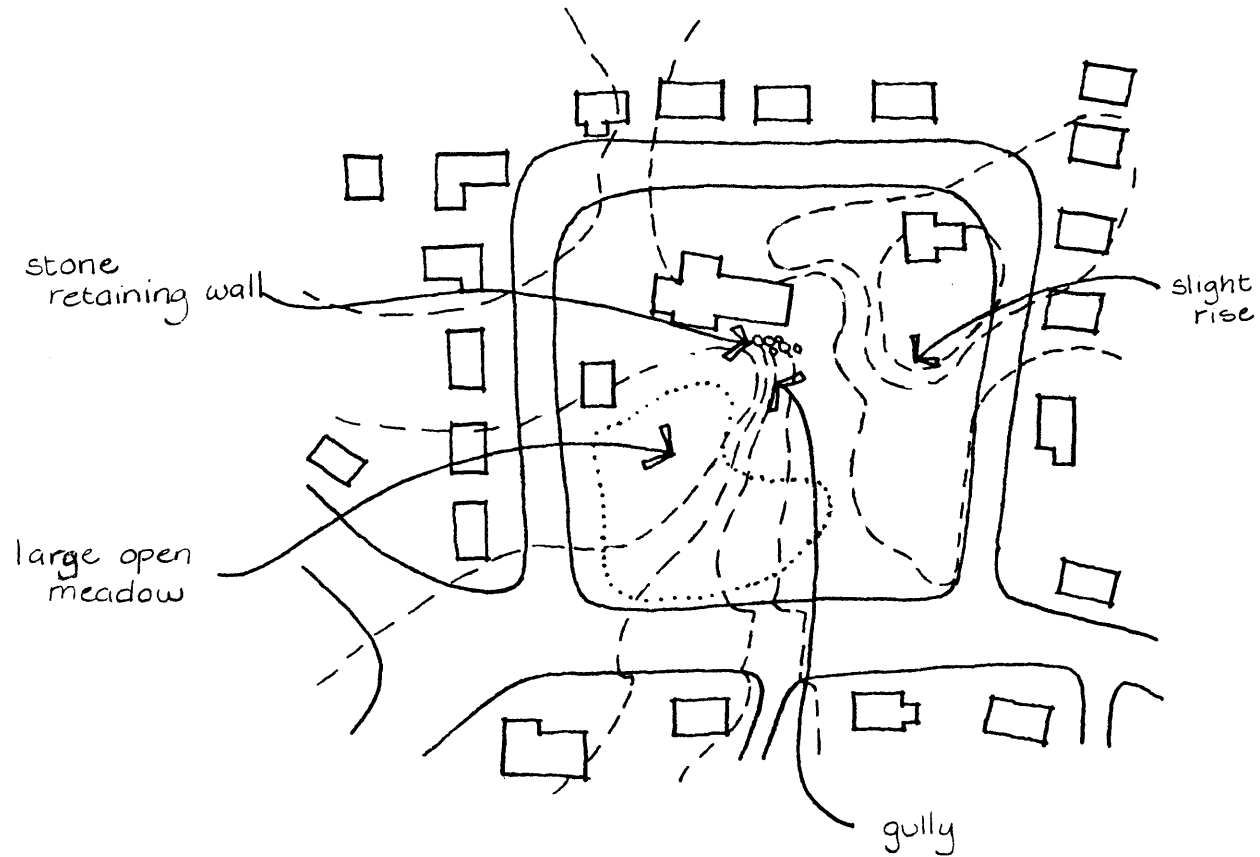
The following illustrations focus on general site characteristics rather than on specific details. They illustrate distinct features in an effort to ensure clarity and to aid in identifying siting difficulties and/or positive attributes.

The site contains many positive features. There is plenty of vehicular access, a variety in the landscape itself (i.e. a gully, a meadow, pine trees, etc.), and a contrast in the scale of the surrounding cottages (now winterized) and the collective scale of the large barn which dominates the site. There is plenty of solar access as well as adequate summer shading due

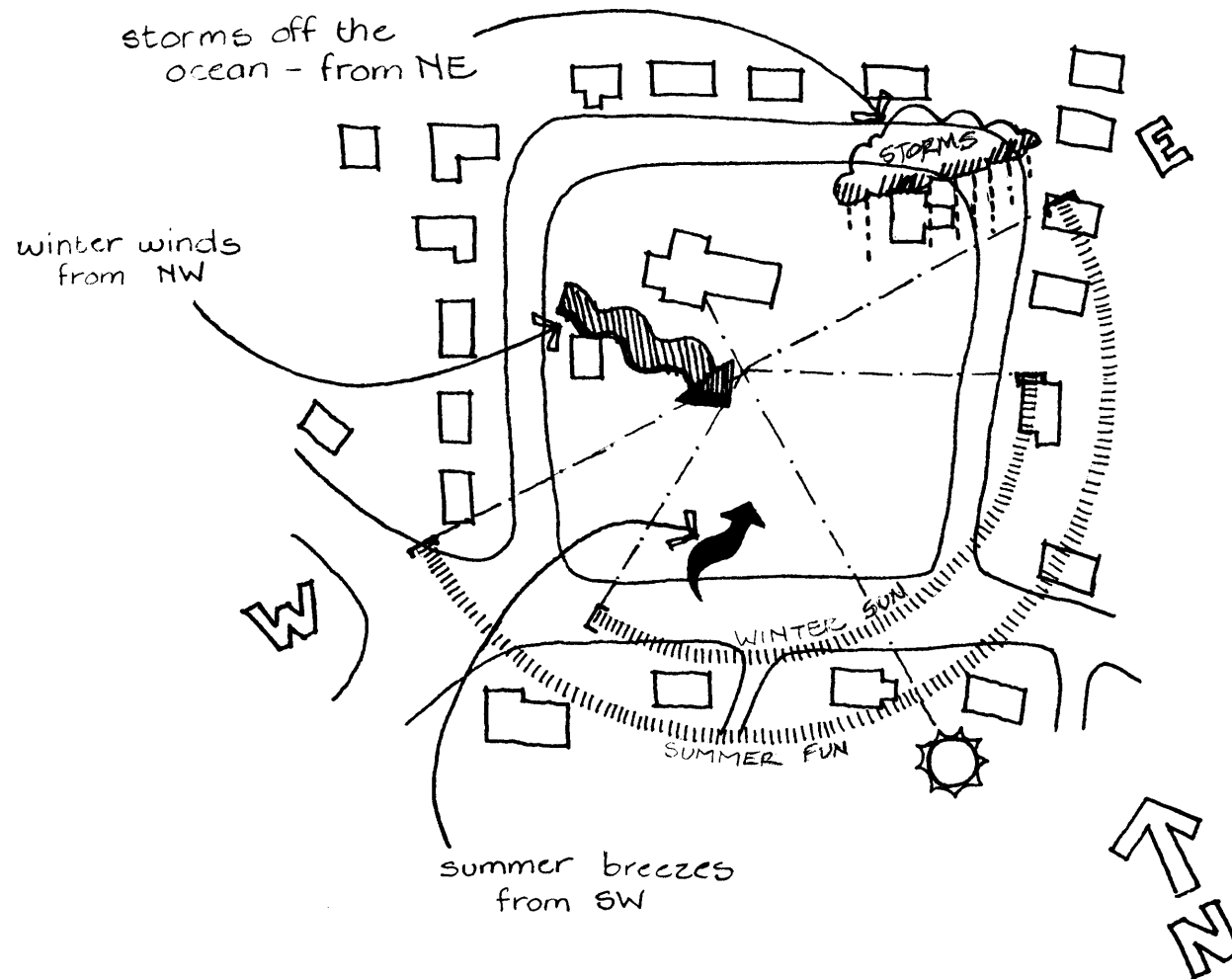
the large deciduous trees on the site.



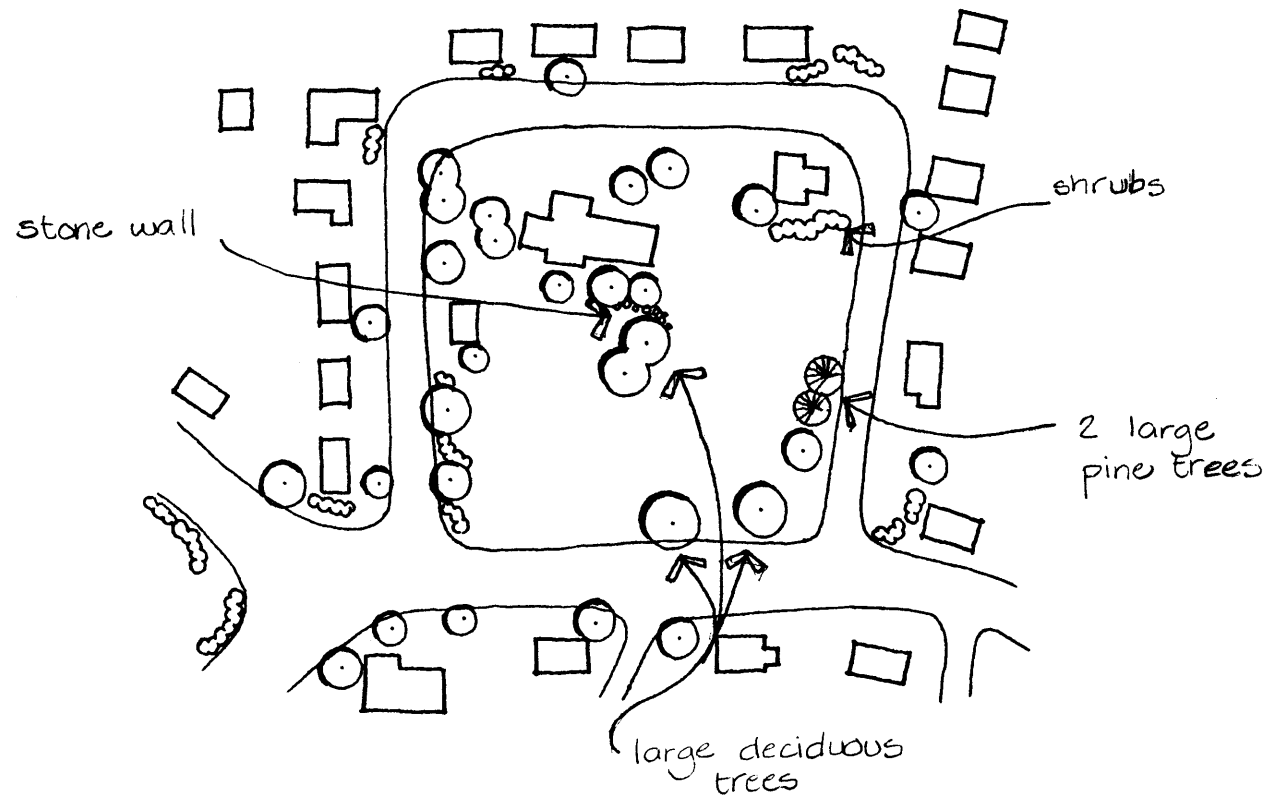
Topography



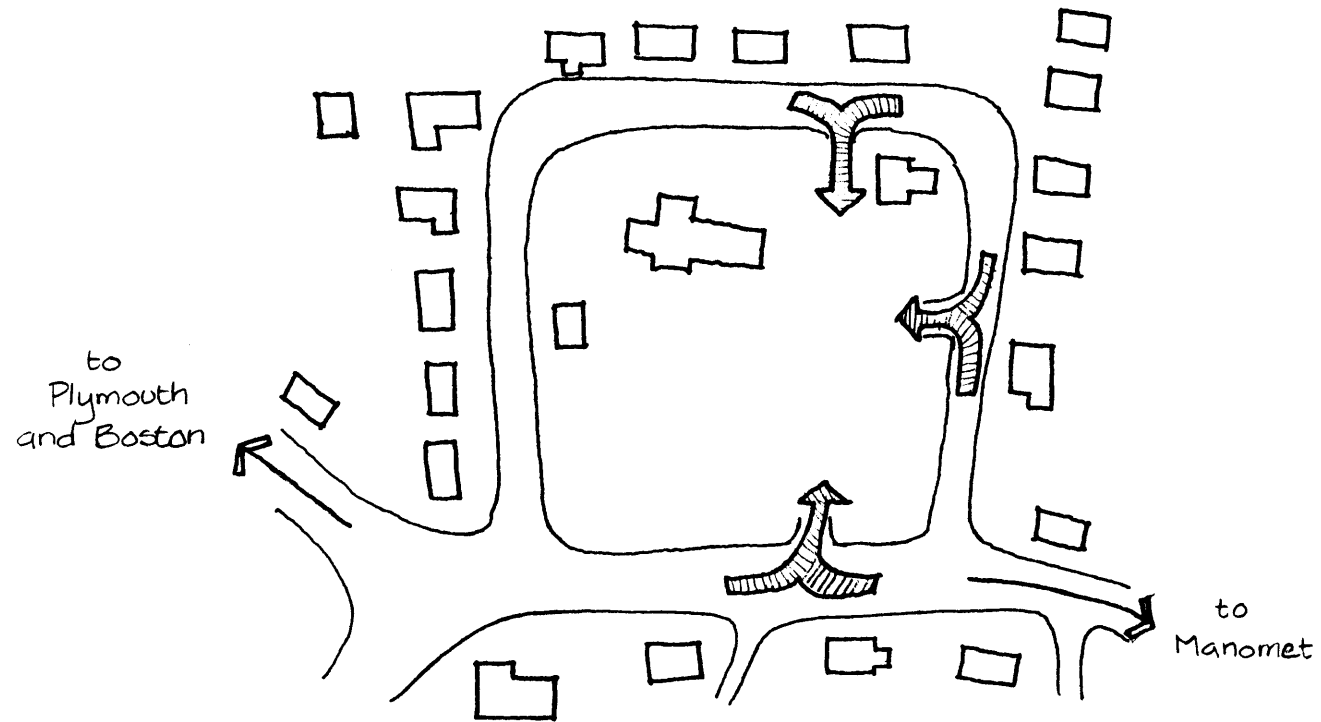
Climate

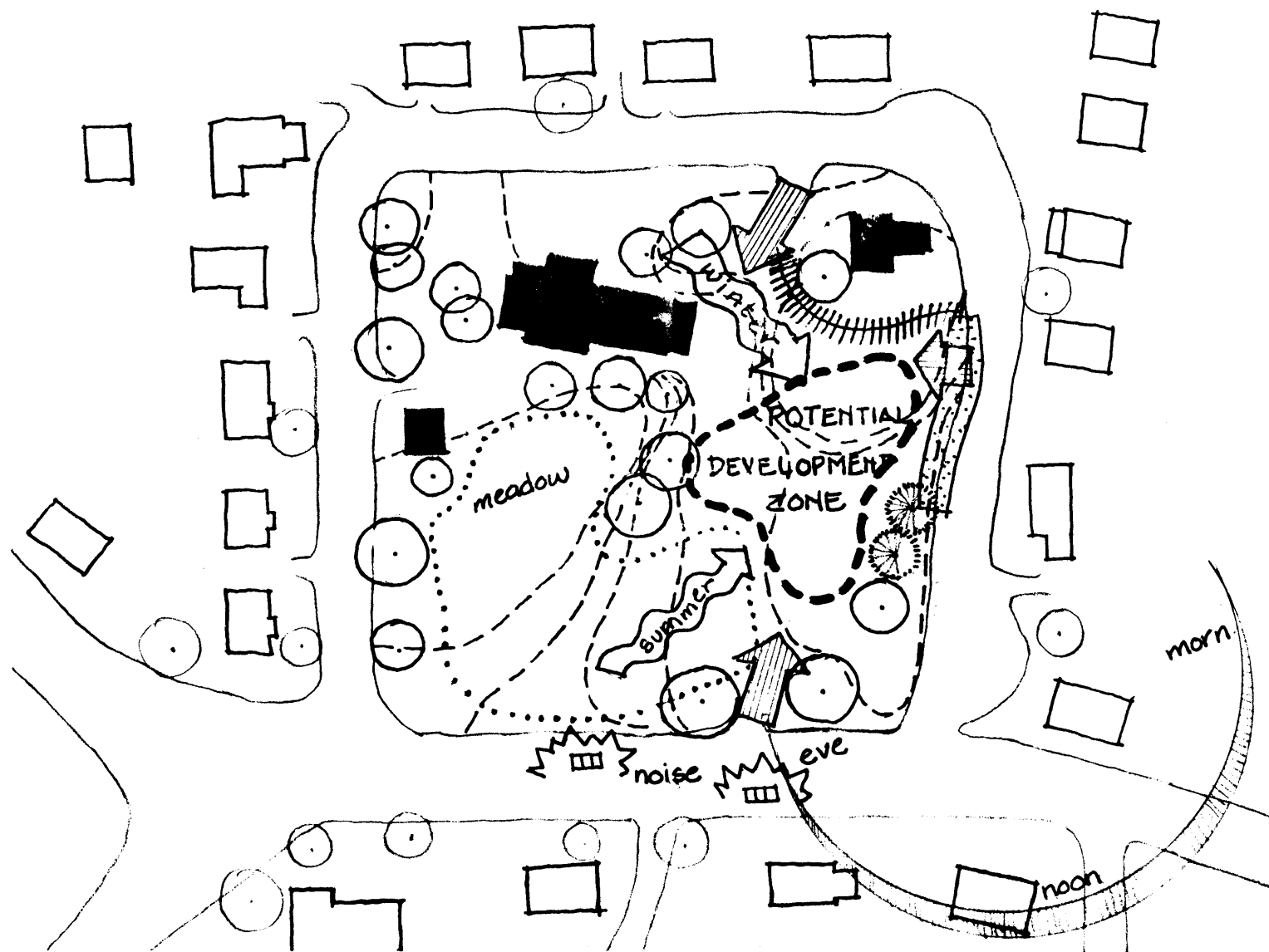


Landscape Elements



Access





Form

Any solution to a design problem is basically an agreement between need, context, and form. All of these components must remain flexible until "fit" is achieved. Sometimes designers expect program and site considerations alone to dictate the solution but form is equally important since there are a number of viable forms that meet the needs of program and site.

The first factor influencing form is housing type. A variety of types and architectural images associated with them are discussed. With consideration of American lifestyle preference and neighborhood image (specific to site), a particular hous-

ing type - the single-family house type (as exemplified in the Victorian era dwelling) - was selected.

Within the single-family house type many spatial organizations (both in plan and in section) are possible. A limited number of these organizations are then diagrammed and described.

Building materials and a structural system are specified and argued for. The construction method has a lot of influence on the form of the building as well as influencing the degree of tractability possible to the inhabitants.

Code restrictions, especially those concerned with control and prevention of

fire damage, can also influence the form of the building. The relevant codes are mentioned and consequences of their implementation in terms of maximum height and maximum square footage are described.

Housing Type and Image

A variety of housing types have been considered as a starting point in the design.

The single-family house connotes a high sense of home identity and there is a cultural preference for it in the U.S. However, the low density and associated high land cost make it inappropriate for many of today's potential home builders. Most non-family related groups that live together do so in a dwelling that was once a single-family house. This is probably due to the availability of this type of dwelling in today's housing market and also due to a strong culturally derived sense of home and "belonging" associ-





ated with a suburban up-bringing and/or the aspirations of ownership.

The detached duplex seems to share many of the aspects of a single-family dwelling (i.e. autonomy, ground association) with a slight increase in density and the possibility for complete subdivision.

The detached four and six-plex forms achieve a higher density but by their nature, two or more upper units are not connected to exterior ground space. Subdivision of these types is complicated by access causing a redundancy of stairs and circulation space.

The townhouse or rowhouse form is another way to achieve density, and yet retain a connection to the ground. The

trade-off is with natural light. By forfeiting the side walls to achieve a tight "packing" of units, the end walls become the only source of light as well as access. The subtleties of subdivision of a group of rowhouses leads to many of the same access problems found in the four and six-plexes.

The highest density housing type, the multi-family, high-rise apartment building, obviously has the most problems with access, subdivision, ground connection and parking.

Some of these housing types were disregarded for this site due to the obvious reasons of inappropriate scale and density. The particular site chosen for the design does not require a high density solution. Row-

house and high-rise forms were thus eliminated.

NOTE:

The author does not mean to suggest that high density house types are inappropriate for group living or are less able to be designed to provide adaptable environments. Certain housing types were deemed inappropriate for the particular context of the design example, however.

A decision to base the design on the American single-family dwelling was made in the light of a sense of "home" (i.e. a sense of identifiable sub-group within the wider community). The form of collective housing or multi-family housing in any country should be rooted in the cultur-

al traditions of that country. Groups do not need to be isolated from the cultural norms of dwelling types. In the United States, domestic architecture is dominated by the single-family, detached house. This type developed because of an abundance of open land and by its isolation, provided for expansion and for privacy. Ignoring twentieth century lifestyles, the rural or semi-rural house was an excellent example of adaptability, of resolution of the changing needs over the lifetime of a family. On a large plot of land, insulated by open space, a house could expand or contract as was necessary (providing the building system made such changes possible).

The domestic architecture of the Victorian age is admired



by architects for its adaptability. Victorian homes did not anticipate long-term changes, however. They simply had room enough (large dimensioning) to accomodate changes. Their steeply pitched roofs and dormers provided excess enclosed space in which to expand

NOTE:

Architectural images of the author are of course evident in the design portions of this thesis. This is not meant to suggest that only one housing type or set of architectural references is appropriate to congregate living. The reader is asked to make an effort to distinguish between the personal expressions of the author and decisions based upon investigations of adaptable/flexible housing and group living interests.

Organization

NOTE:

By "organization" the author means to suggest the deployment of spaces and the implications to public and private use locations that various deployment methods usually make. "Organization" as described by the following diagrams is not really related to precise functions of rooms.

There are many abstract theories of building organization (i.e. radial, spiral, grid-determined, linear, etc.) but basically there are relatively few categories of organization that can be used to diagram any building. Within the assumption of a single-family house type, there are then a limited

number of organization types to consider.

NOTE:

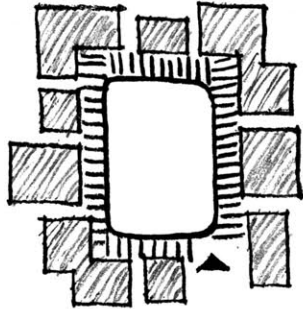
The author points out that there are probably many (but certainly a limited number of) valid organization types for single-family dwellings. The ones presented in this thesis represent an attempt to recognize the more common and culturally (U.S.) accepted forms of dwelling organization keeping in mind the suitability of each for congregate living. Factors particular to the site including New England climate and available access points were considered in narrowing down the list of organizations -

making courtyard or patio organization, for example, unsuitable for inclusion.

Organization types are illustrated both in plan and in section and each is briefly described. Merits and liabilities of each organization in terms of its possibilities for adaptation and/or communal living are then listed.

Plan Organization

Centralized



This type of organization places all common spaces in the center of the building's plan with privacies and circulation wrapped around the common spaces on all sides. The common spaces may occupy one or many levels and may be rooms or exterior spaces as in atrium or courtyard houses.

Merits:

- allows all privacies contact with exterior permitting possible expansion
- allows choice among a wide variety of qualities and orientation of privacies

Liabilities:

- must provide a ring of circulation (excess) in order to prevent circulation from disrupting common activity areas
- permits only one-sided expansion of most privacies
- requires careful shielding of privacies from public view
- little identification of public and private areas on exterior of building
- special handling of lighting and ventilation is necessary for making common spaces "liveable"

Scattered

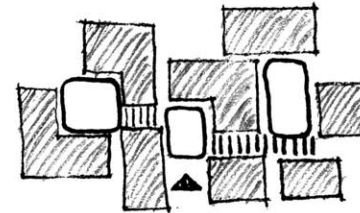
This organization splits up required space for communal activities into room-size spaces and distributes them among the private spaces. This allows closer proximity to the communal spaces but neglects to address the fundamental adjacency and isolation requirements of public and private spaces.

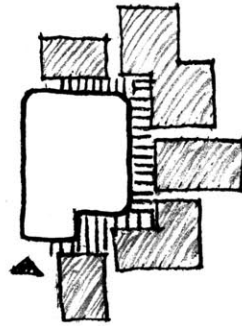
Merits:

- flexibility of changing uses (converting a public space into a privacy)
- can combine circulation with communal space
- allows possibility of breakdown of dwelling into a series of smaller sub-units (each with its own common space)
- allows both communal and private spaces access to exterior space

Liabilities:

- requires careful shielding of privacies from public view
- guests and outsiders may become confused because public/private distinctions are blurred
- fundamental use adjacencies of common spaces are negated
- lacks a focal point (both exterior and interior) for spatial hierarchy understanding





Peripheral

This type of organization places common spaces on an exterior edge of the building's plan and surrounds them on the remaining three sides with privacies. It allows both common spaces and privacies contact with exterior space and presents a clear understandable image of public and private zones both on the building's exterior and within the building.

Merits:

- clear organization for guests and outsiders (distinction between public and private zones)
- allows both communal spaces and privacies to have contact with exterior space permitting expansion
- common areas receive adequate daylight and ventilation
- clear perception of common spaces from building's exterior

Liabilities:

- requires special handling of public/private interface zone
- communal spaces given ground/edge connection but are least likely to need to expand
- only one-sided expansion of privacies
- requires careful shielding of privacies from the public view

Spinal

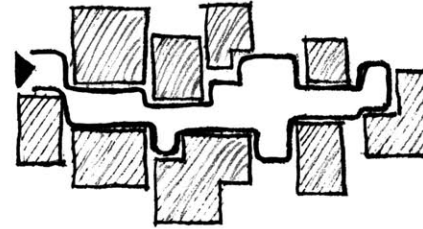
The linear or spine-like organization type arranges all spaces along a circulation path which at times becomes enlarged to accommodate communal activities. This type of organization provides flexibility but lacks a sense of hierarchy and distinction between public and private spaces.

Merits:

- allows all spaces with exterior edge contact permitting expansion
- allows flexibility in redefinition of room use (common spaces may become privacies and vice versa)
- allows for breakdown into sub-units (if circulation is correctly located)
- provides communal spaces with light and ventilation

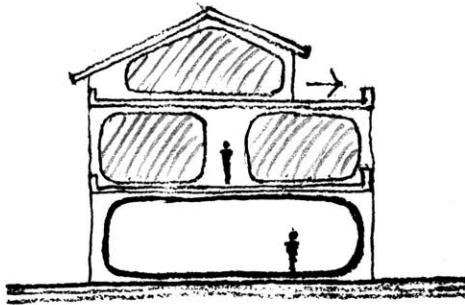
Liabilities:

- requires careful shielding of privacies from public view (all circulation is common space)
- organization and hierarchy of spaces is not clear guests and outsiders not isolated from intimate/private zones of the house



Section Organization

Stratified



This organization type, with communal spaces at grade and privacies above (the most private spaces being the farthest removed from the ground) is perhaps the most common (in the U.S.) and therefore the best understood section organization.

Merits:

- guests and outsiders remain isolated from the more intimate/private sectors of the house (communal spaces act as a filter for privacy)
- clear, understandable, culturally familiar organization
- communal spaces have easy access to exterior spaces (patio, garden, garage, etc.)

Liabilities:

- private spaces deprived of large, ground-related adjacent outside spaces
- private spaces allowed no substantial expansion
- communal areas have most ground association and are least likely to need expansion
- relies on vertical distance for privacy definition (less flexibility since vertical discontinuities are hard to overcome)

Lifted

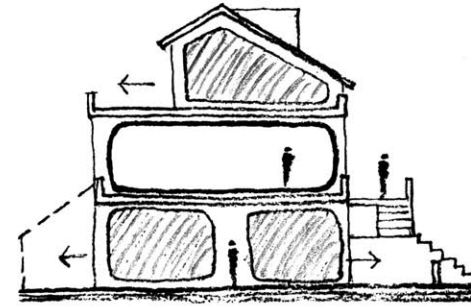
This type of organization offers communal spaces on the middle level with privacies both above and below. It depends upon a carefully executed transition from grade up to the middle level. The cultural references for this type of organization are urban Renaissance villas whose main floor (or "piano nobile") was one flight above the street. However, today's split level homes employ the same organization with some modification of the earth around the dwelling.

Merits:

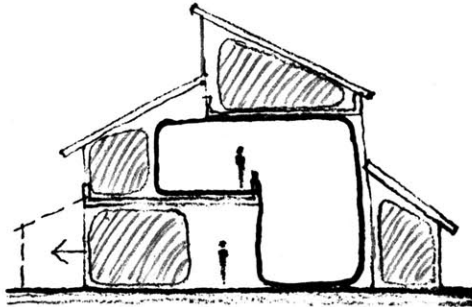
- choice of a wide range of qualities of privacies (i.e. upper level privacies with a sky and light
- connection and lower level privacies with exterior space and expansion possibilities)
- allows the possibility of independent access of lower level privacies

Liabilities:

- must either make grade changes or a skillful stair connection to middle level in order for the middle level to be used as a common entry
- requires careful shielding of lower level privacies from views from the public access
- requires careful placement and definition of interior vertical circulation to make the organization of public and private areas clear



Combination



This type is really a modification of the Stratified and Lifted organizations. The concept is that the communal space is volumetric (comprising space from more than one floor level) and therefore allows a more intimate and therefore less formal relationship of private and communal spaces. It also allows more "wrapping" of privacies around common areas (in 3 dimensions) giving each privacy a connection to an exterior edge.

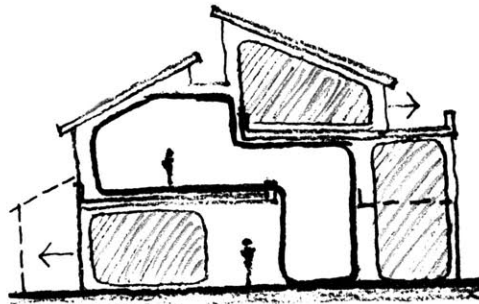
Merits:

- clear perception of relationship of privacies and common spaces
- allows flexibility of expanding (by taking over a privacy) or contracting (by closing off portions) of common space as use needs change
- lets common spaces feel large and public (2 story spaces) without diminishing flexibility options of privacies
- allows some privacies to be connected vertically into sub-units composed of 2 or more privacies

Liabilities:

- requires careful shielding of privacies from communal spaces
- requires careful handling of vertical circulation to provide non-public access and egress from privacies

OR



Core

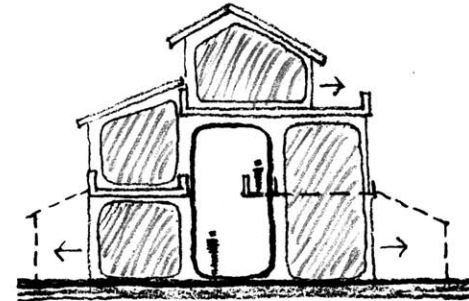
This organization type, found in villas, hotels, and some dormitories arranges private spaces around a central multi-story space which includes all major circulation and communal activities. The privacies then all have exterior edges. This type of organization also features clarity of distinction between public and private realms.

Merits:

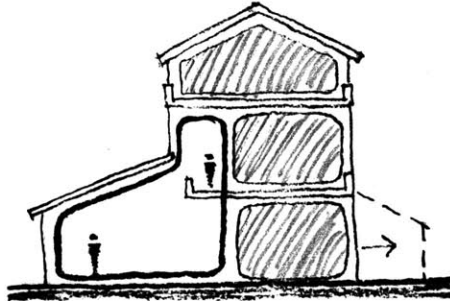
- privacies are allowed access to exterior edges permitting experience of exterior spaces and possibilities for expansion
- allows some privacies to be connected vertically into sub-units composed of 2 or more privacies while maintaining interior public access to all privacies
- choice among a wide variety of qualities and orientation of privacies

Liabilities:

- must get light and ventilation into the core/common spaces
- requires careful shielding of privacies from communal space
- requires careful handling of vertical circulation to provide non-public access and egress from all privacies



Edge



This type of organization, most often found in elderly housing facilities, puts all circulation and common spaces at one edge of the dwelling. This organization sets up a strict hierarchy between communal activities and private activities but allows both privacies and communal spaces contact with the building's exterior.

Merits:

- clear perception of the relationship of common spaces and privacies
- guests and outsiders remain isolated from the intimate-private sector of the house (communal spaces act as privacy filters)
- privacies have at least a one-sided connection to the exterior allowing experience of exterior spaces and possibilities for expansion
- communal spaces have access to exterior space

Liabilities:

- communal spaces given ground/edge territory but are least likely to need to expand
- common spaces are isolated from privacies (an "institutional" rather than a "home-like" atmosphere)

Building Materials and Structural System

There are many approaches to structuring an adaptable/flexible environment. Basically, a building can be "over-structured" or "under-structured" in order to either provide clues for future adaptation or to make sure that structure won't interfere with changes in layout.

The approach taken for this project is over-provision of structure. The alternative approach, reducing the number of supports and increasing the beam spans, can be quite expensive, since the size and therefore the cost of horizontal members increases with the load but in proportion to the square of the span.* Although costs are not a major determinant in this thesis, the cost

of "minimal" structure can be significant - halving the number of supports can double the cost of the structure. An "excessive" supply of space and construction elements provides possibilities and opportunities for future use.

Another stimulus that a construction system can offer is a clear distinction between elements of support and elements of separation. A differentiation by materials can inform the inhabitant about which elements of his dwelling are easily changed and which elements are alterable only with the aid of experts. The joints between different elements must be easily understood in order to "incite alterations according to the

*Tom Heath, *"Designing for Change in Architecture: Diagnosis and Cure"*, 159.

**Zurich group, "Eidgenossische Technische Hochschule", in Participation and Reuse, ILAUD Annual Report 1978, 29.*

demands of use."*

The aforementioned criteria have led to the selection of a particular construction system that combines a variety of materials differentiated to indicate degrees of tractability, a system that can be easily understood, and a system that can be "oversized", yet avoid an institutional, heavy scale.

The principal structural material will be light wood framing (so-called "balloon" or "platform" framing) with reinforced concrete foundations and "fixed" cores. Masonry (brick and concrete block) will be used to give special connotations of hearth but never for bearing walls.

Primarily, the structure will incorporate many light "sticks" (studs, joists, raf-

ters) too frail to carry much load individually, but when tied together by bearing plates, sheathing, and decking act collectively to resist a variety of loading conditions. Thus, the primary construction system reflects the advantage of pooling individual strengths and resources--one of the motivating factors people have stated for shared living groups.

The framing system also displays flexibility. Although the system is dependent upon small, evenly distributed loads, it also allows for considerable fragmentation of the plates, sheathing, and decking. Addition of an extra stud or joist in the proper place can increase the capacity to accommodate modest concentrations of loads. Openings

in floors, walls, and roofs can be built by simply substituting a beam, lintel, or header where openness is needed, as long as spans are not too great and openings are not too frequent.

The system is really the essence of an "all purpose" system--pliant and adjustable to new loading conditions. It requires no knowledge of up-to-the-minute building technology developments, since this system has been in use from the earliest days of this country. Any public library could supply the do-it-yourself home carpenter with the basic knowledge that would enable him/her to understand the construction system.

Therefore, the system requires that the loads be relatively light and rather

evenly distributed and that the spans not be excessively long. The system is, therefore, quite satisfactory for our residential purposes.

The various materials in the system provide a range in terms of degrees of tractability. The "fixed form" or very hard to alter, architect-determined pieces of the building, i.e. some stairs, utility stacks, some floor slabs, etc., will be of poured concrete. These elements are virtually "intractable" (except to qualified and skilled experts).

The masonry pieces of the building are limited and only "marginally intractable." Because masonry is an additive approach to a continuous surface, bits can be added or subtracted to change wall

heights. However, the solid nature of brick and concrete block together with the wet-process of mortared joints makes it difficult for the average home handy-man to tear down or build up a masonry wall. Although the use of brick is not necessary structurally, some is used because of its surface texture and heat storing capacity.

Wood is of course a "highly tractable" material since many people are familiar with the dimensions and tools needed for working with wood. The flexibility aspects of a wood system have been previously discussed. Qualities of wood such as the variety of size, span, color, and finish can not only provide a range of options for choice but also

encourage participation in terms of personalization of the material itself.

Other systems within the building are assumed to be only "relatively tractable" and only for skilled tradespeople. Plumbing, heating, and electrical systems are assumed to be the responsibility of the architect. If correctly sized and located to anticipate change, there should be little need to relocate major bathrooms or electrical outlets, for example. Noting, however, that the most often changed or remodeled rooms of a house are the kitchen and bathrooms, it is obvious that a need for flexibility exists even in rooms where storage and equipment must be built-in. In the predictable future, kit-

chen equipment will be marketed that is more mobile and attached the way some portable dishwashers are, with flexible hoses and electrical lines which would allow for a greater distance from utility stacks and more variations in arrangement to suit individual styles of cooking and would allow equipment to act independently of walls so that it could be moved to new rooms as long as there was access to a utility stack. There is an anticipation that this idea of flexibility will soon be applied to bathroom fixtures also.

The infill of the building framework is virtually unlimited. Stud walls, windows, doors, sandwich panels faced with cloth, and screens of all types can be and should

be used as infill. Opportunities for personalization and adaptation are greatest at this level. Infill would be categorized as "very tractable" as well as moveable and operable. Although the exterior infill elements (or "building skin" are relatively hard to alter due to moisture sealing, roofing problems, and insulation considerations, a great deal of personalization potential is available considering the choices in paints, stains, siding, types of windows, and exterior ornamentation.

Of course, the "ultimately tractable" components of any dwelling are the living inhabitants (plants, animals and people) and their possessions. It is the addition of this component that gives the

whole building life and insures an ever-changing environment.

A Word About Fires

In selecting an under-standable, flexible, inexpensive, wood construction system, the liability of the burnable nature of wood must be considered. The positive aspects seem to outbalance the negative, and since many wooden buildings have been around for quite some time, the risks seem justifiable if the following precautions are undertaken.

Present building codes provide guidelines in two main areas--the need for adequate access to an egress from a building, and the requirement of various fire resistance ratings for certain materials and types of construction. Some arbitrary rules for dealing with each of these issues

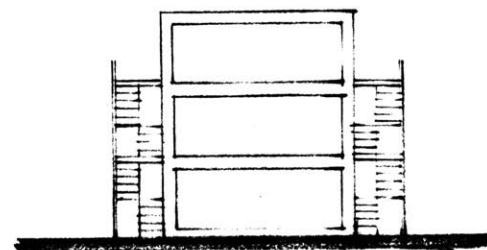
will be assumed for our purposes.

The building should be no more than three or three and a half stories in height. Each dwelling unit should have at least one means of egress and if there is a third floor unit two means of egress must be provided. If a three story building shell is divided into two dwellings with the entrance to the upper floor unit only one floor above ground, then only one stair is necessary (providing vertical circulation inside the unit is also necessary). Winder stairs are not considered as a means of egress.

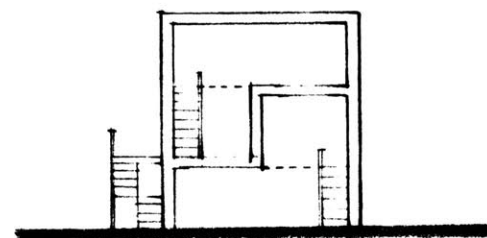
To insure that fires do not spread causing extensive damage, buildings constructed

of a light wood framework should be divided into increments of not more than 10,000 square feet of floor area. This can be accomplished with continuous fire walls of concrete block or poured concrete (2 hr. rating) extending from foundations through the roofs. Another fire barrier may be formed by leaving open space between buildings. This space should be not much less than eight feet wide and should always remain unbuilt. Because of the necessity to provide the possibility for vertical connections and the necessary vertical chases for utilities, attempts to prevent the vertical spread of fire by dividing the building horizontally with poured slab floors are virtually prohibited.

Fire separation walls must be made of "fixed", intractable materials in order to resist change and insure the integrity of the barriers against fire.



3 APARTMENTS
2 means of egress



2 APARTMENTS
1 means of egress

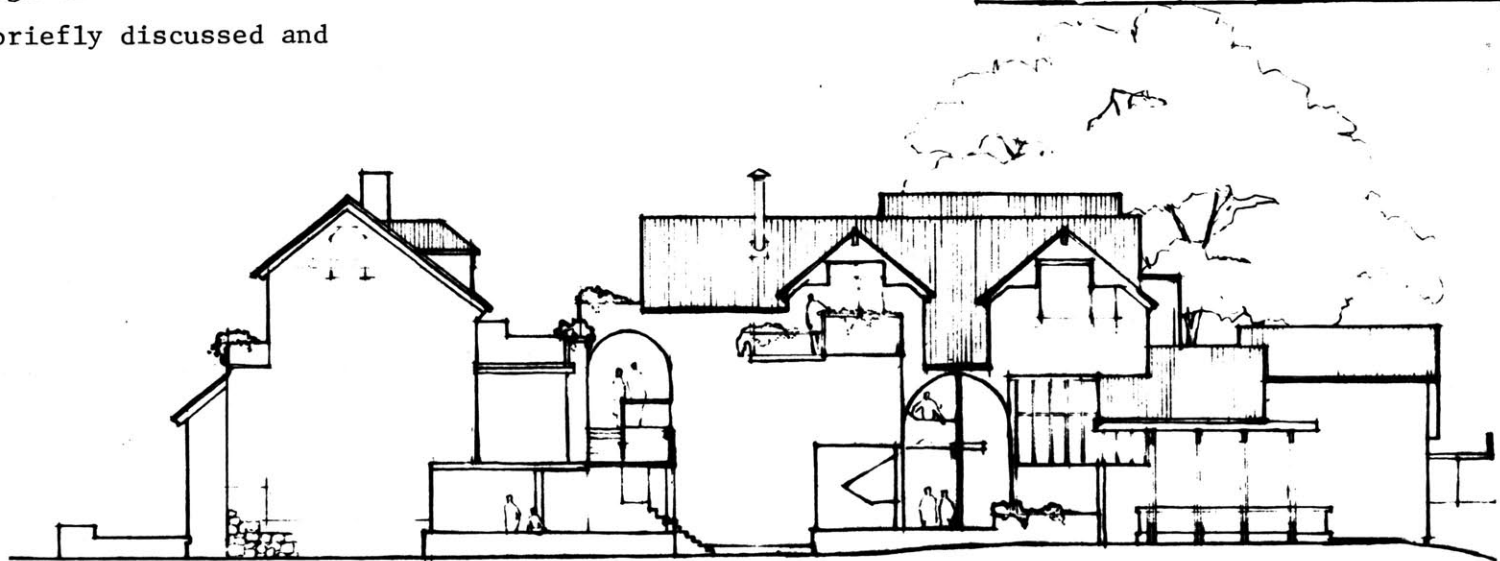
Alternatives

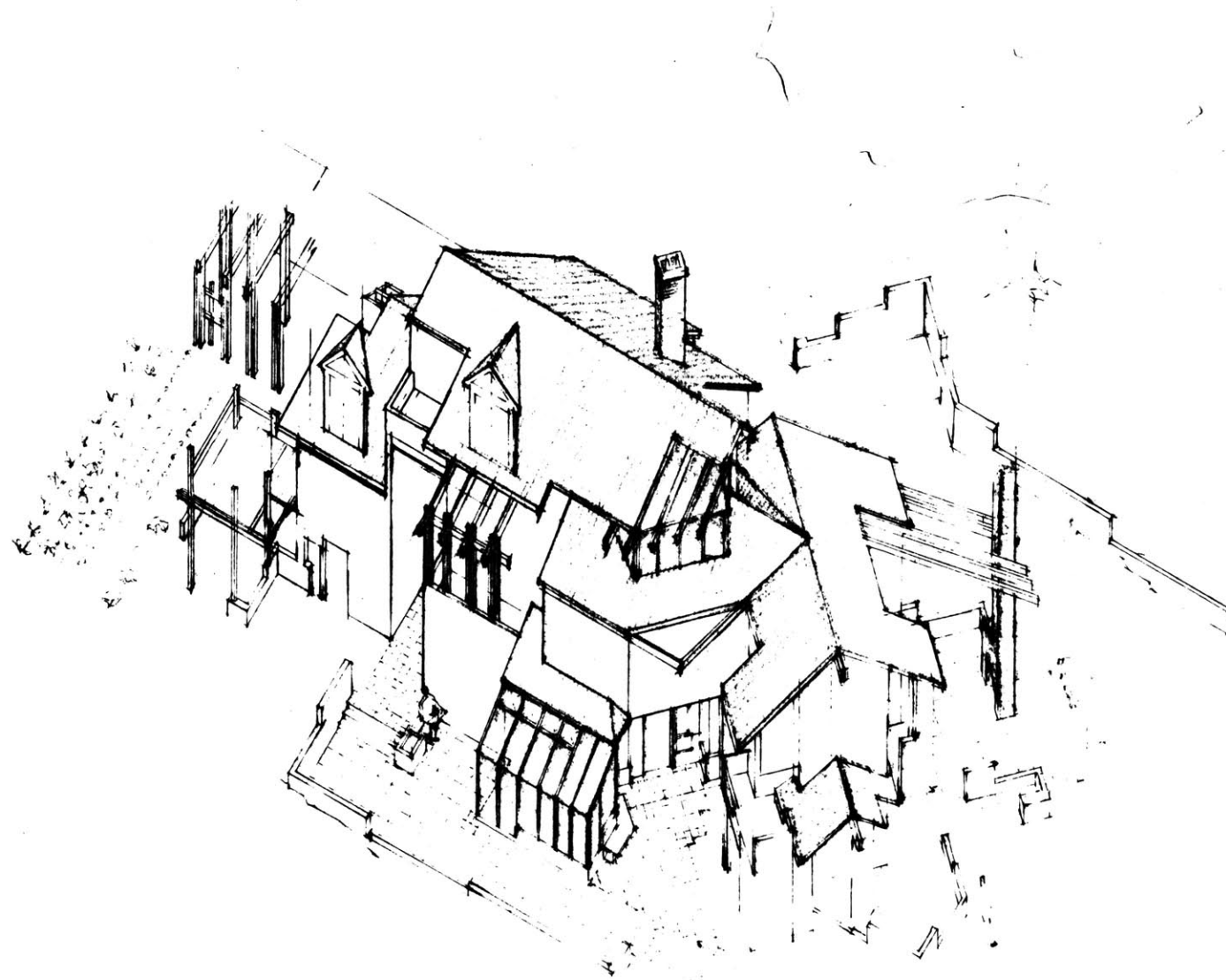
By taking into account all of the previously outlined factors of need, context, and form, the designer must begin to formulate a design scheme or schemes. For this particular design problem, organization types developed in the section on form are combined as a basis for starting to put together three different design alternatives. Each is briefly discussed and

In the following chapter the three alternatives will be compared and evaluated in light of some selected design criteria. The goal is to combine the positive aspects of each alternative into one consolidated preliminary design.

NOTE:

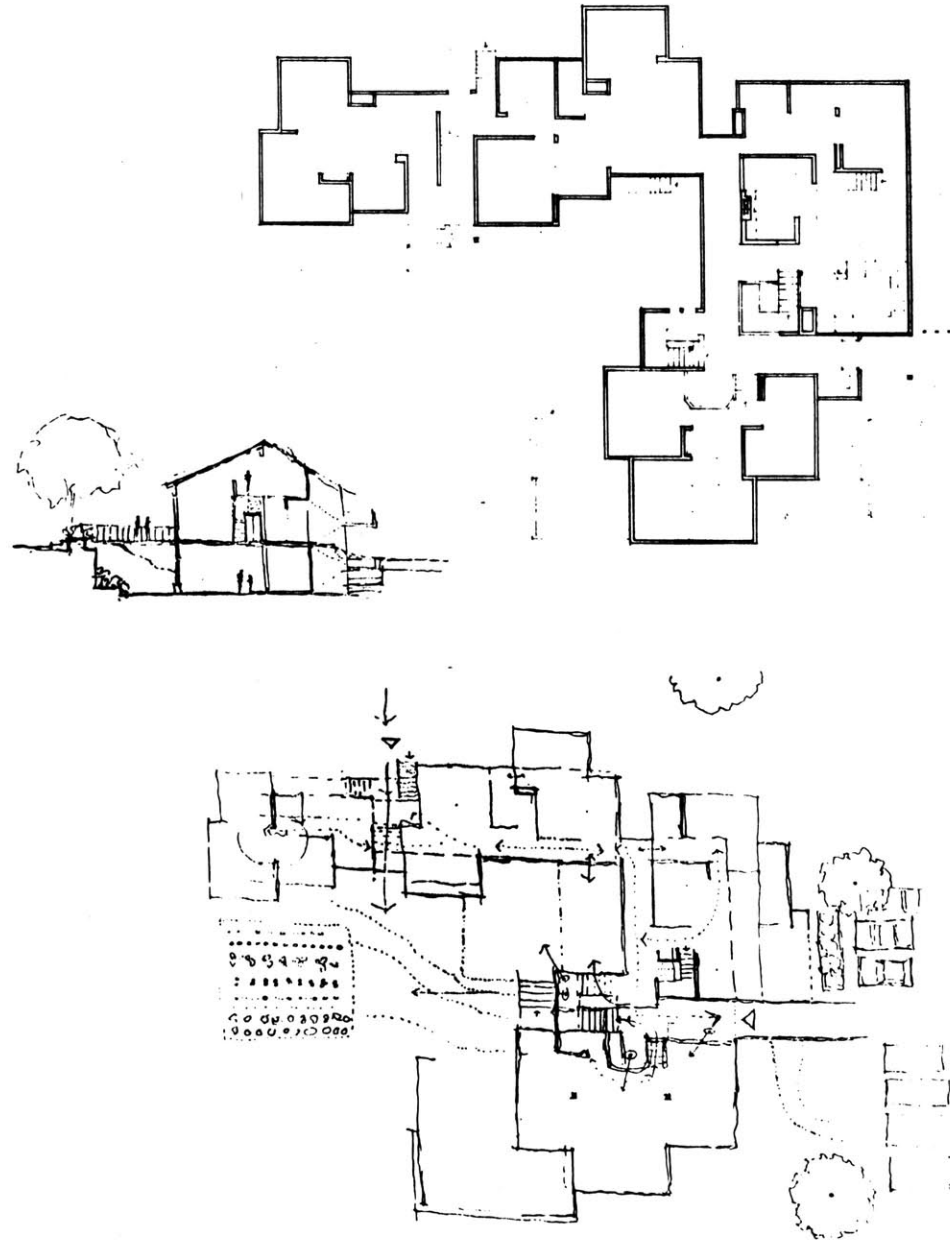
The alternatives presented here are only a few of the many possible permutations. They are drawn and evaluated in a somewhat precise way in order to make explicit the normally intuitive and personal design process of the author. It is hoped that by being candid and somewhat overly documented, the resulting design will seem less arbitrary and subjective.

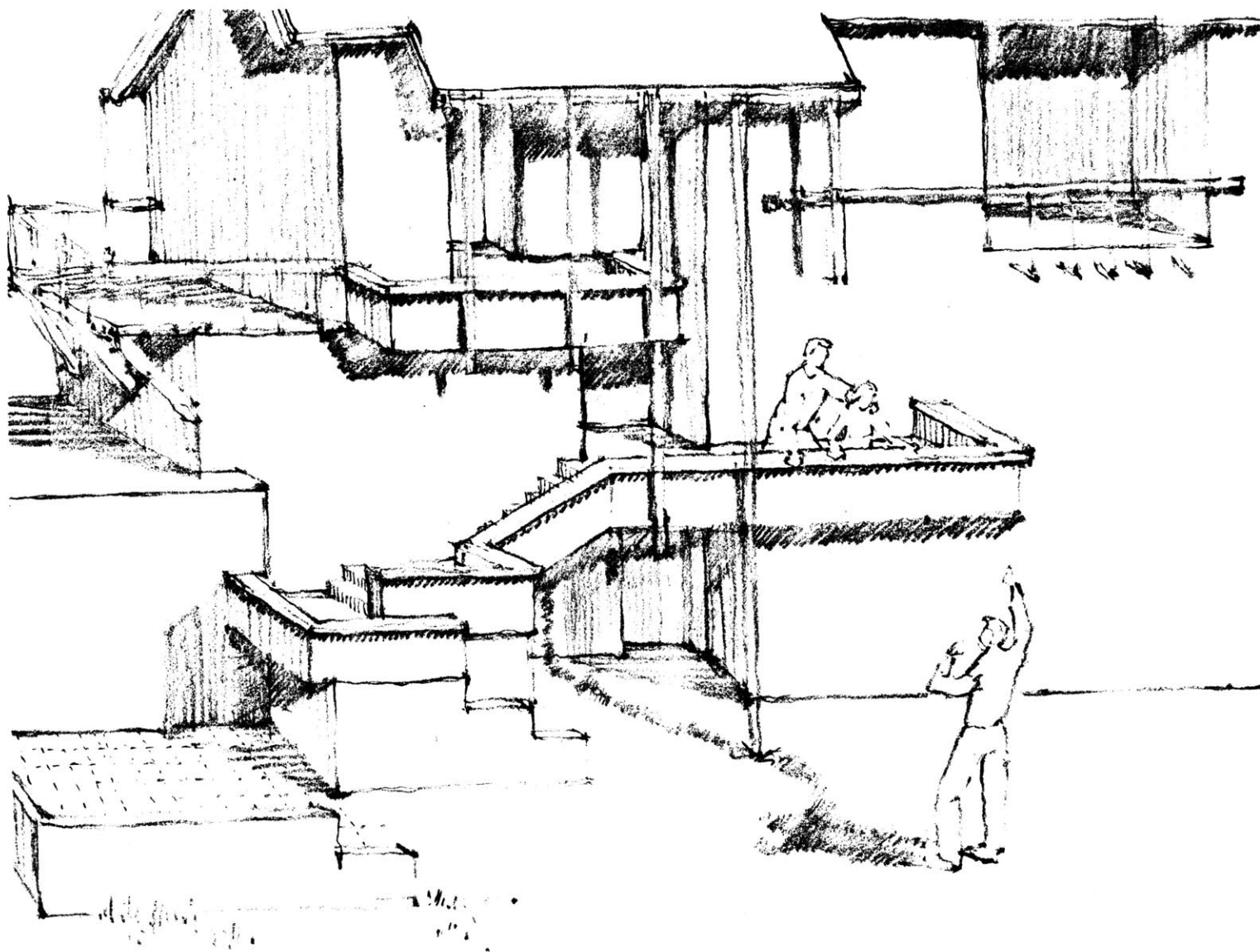




Alternative 1

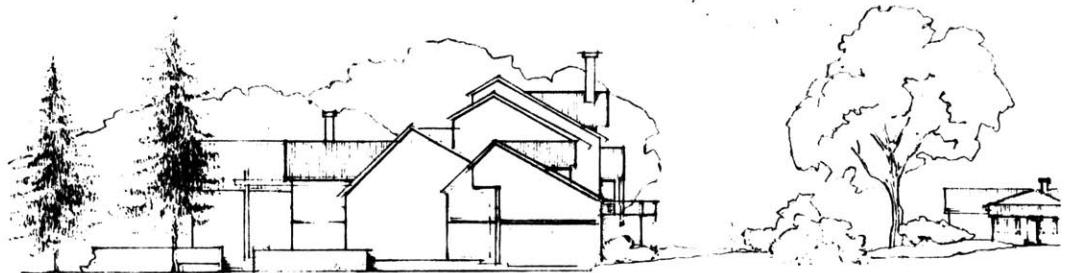
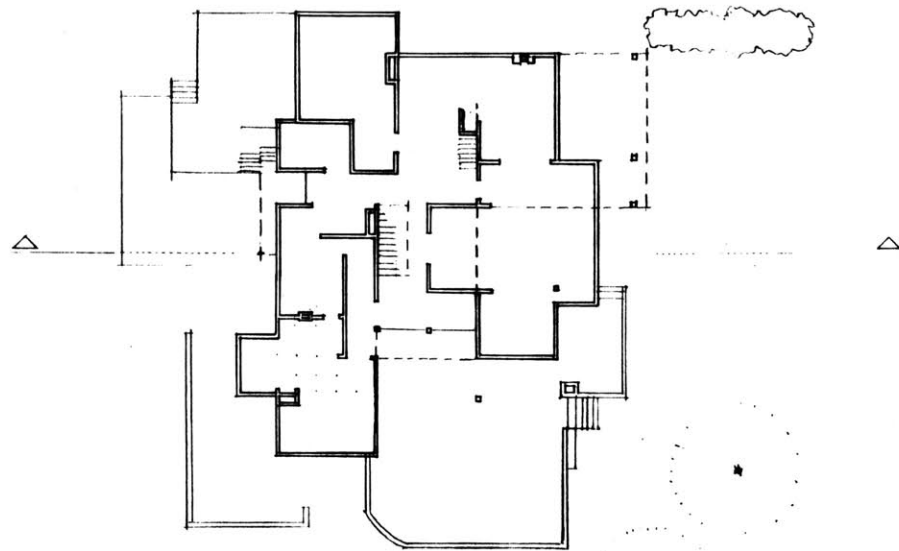
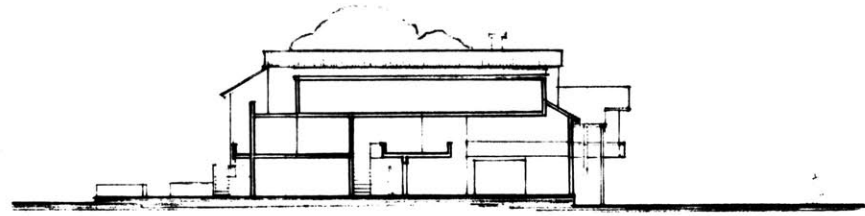
The scheme employs a spinal plan organization and a type of modified lifted section organization. Since the transition from grade to the second level was difficult and uncommon in this context, a sunken territory was provided in order to get some of the advantages of a lifted organization with privacies connected directly to the ground as well as upper level, sky-related privacies. The circulation is linear but wraps around a central, common outdoor space. The massing of the building allows most privacies a view over the meadow but solar orientation is not adequately addressed.

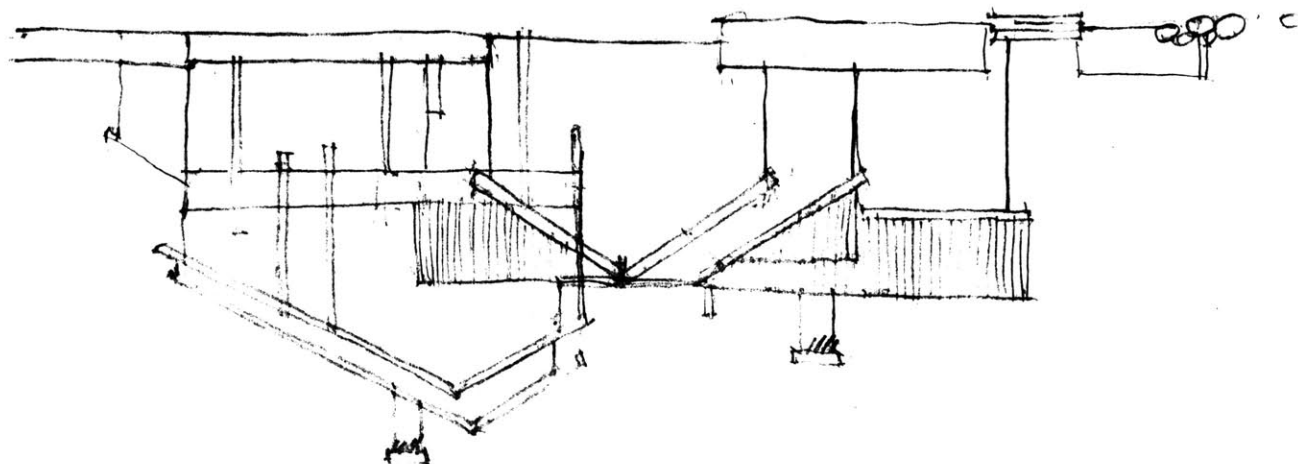
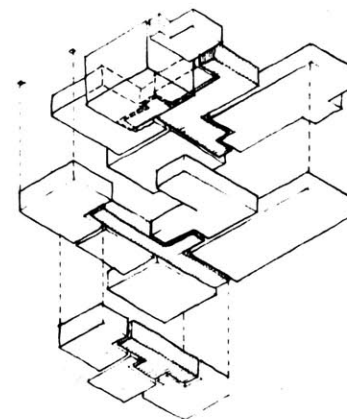
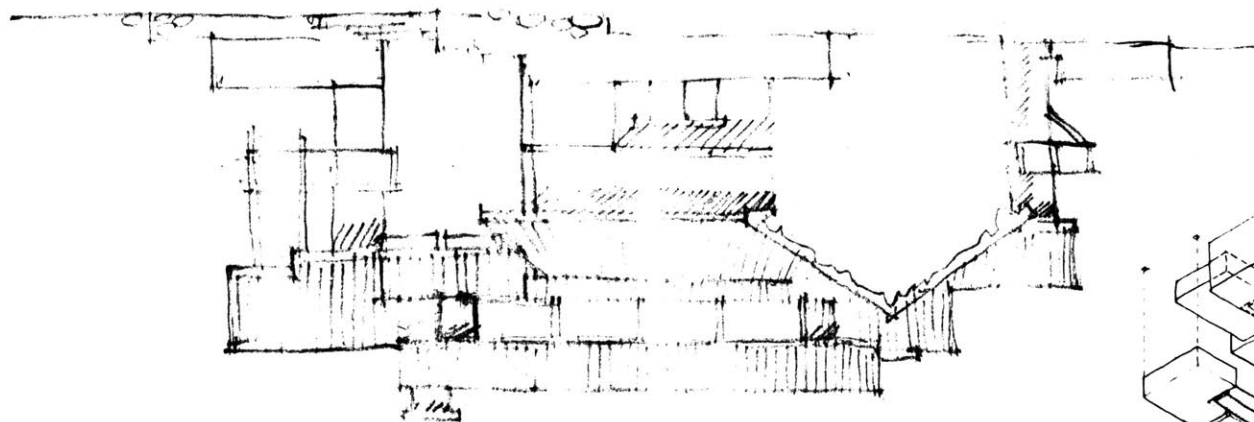




Alternative 2

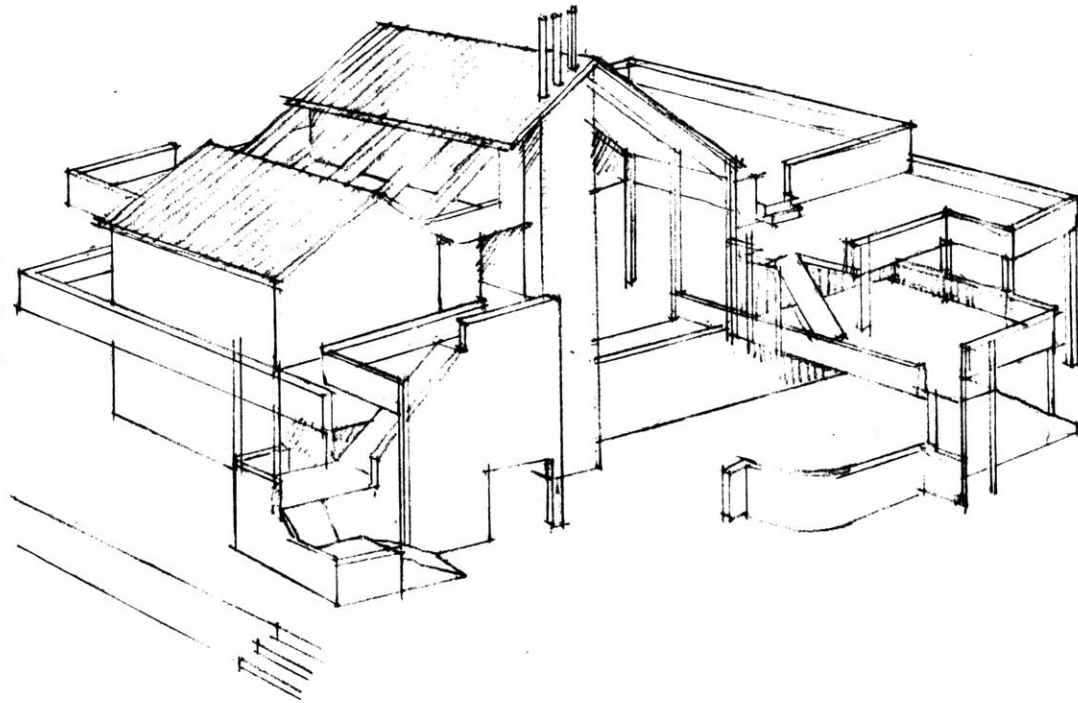
The design scheme is compact and focuses on a peripheral common space with privacies wrapping around it. In section, the central space is double height (see combined section organization) allowing upper level circulation to be used as part of the communal space. The upper floors are laid out with a predominant east-west circulation to allow privacies favorable solar access. The ground floor privacies are reached by means of a central hall and are also allowed secondary connections to connections to other privacies (for the purposes of flexibility and expansion). This scheme represents a relatively understandable, culturally accepted system of house organization.

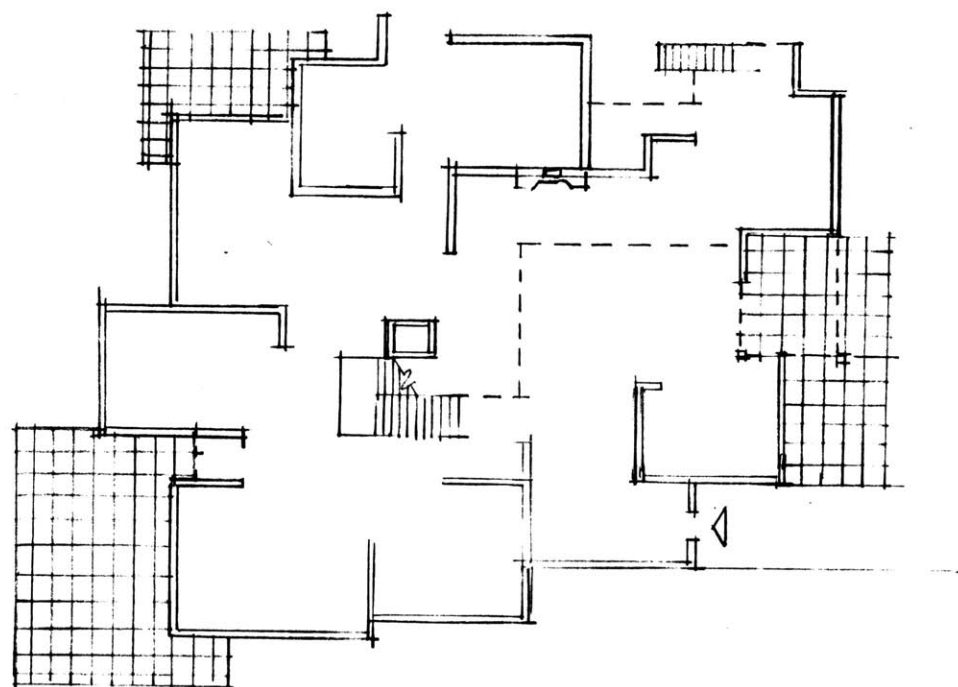
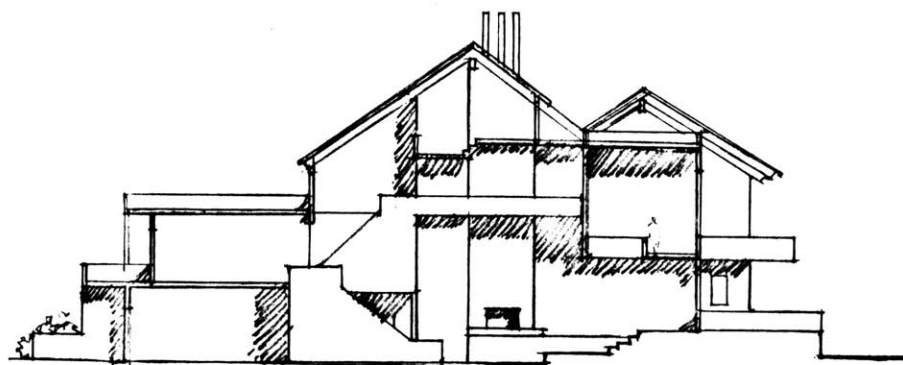




Alternative 3

This scheme combines a centralized common space in plan with a core type section organization to create a dramatic open central space in the house. All the privacies are reached through this core space and are allowed to optionally participate or close themselves off from the common activities which take place in the core space. The privacies are allowed access to the exterior (permitting possible expansion). This scheme provides choice for the inhabitants by supplying privacies of all orientations and sizes. Acoustically, privacy could be a problem but circulation is efficient and serves as a buffer between the core and the privacies.





Evaluation

Evaluation is literally "placing a value on something." In order to assign values, one must know the "criteria" or standards by which one is measuring the alternatives. A set of values or "design criteria" must be developed or uncovered.

The criteria need to be comprehensive. They need to include a wide range of aspects considered to be important by the evaluator.

Also, it is necessary to specify whose values the criteria represent. On a large project there may be considerable mismatch between the values of the client, the designer, the intended user, and even society as a whole.

NOTE:

For this project, the criteria are based upon the values of the author which have been influenced by the ideas presented in the early chapters of this thesis.

In order to be considered valid by outside observers, criteria must display a balanced approach. Both conceptual and perceptual factors must be considered in setting up criteria. Conceptual evaluation is heavily influenced by such things as organization, consistency, and hierarchy as reflected in plans and sections. Perceptual evaluation deals with

the direct experience of a person inside (or outside) the building as reflected in perspective sketches. Both of these types of criteria must appear in a balanced approach to evaluation.

Design Criteria

Need:

Accommodation of Functions - Does the scheme provide proper space and adjacencies for all activities both public and private?

Communal Space - Are the common activities accommodated with enough space and light, and is the communal space a nice environment to be in?

Privacies - Are privacies located and sized adequately and is there a choice of types of private environments?

Flexibility - Does the scheme promote reinterpretation of space use and allow for expansion?

Circulation - Is the circulation pattern understandable and efficient?

Exterior Space - Are exterior spaces located and sized to encourage outdoor activities?

Context:

Solar Orientation - Does the scheme orient spaces (particularly privacies) to take advantage of sunlight?

Access - Are all points of potential access (both pedestrian and vehicular) addressed?

Scale - Does the scheme respond to the scale of surrounding buildings and landscape as well as the incorporation of all necessary functions?

Views - Do spaces have the possibility for pleasant, unobstructed views of the surrounding landscape?

Adjacent Buildings - Does the scheme respect the private nature of adjacent territories and allow spaces to be somewhat sheltered from the view of neighbors?

Form:

Organizational Clarity - Is the organization of spaces clear, understandable, and culturally familiar?

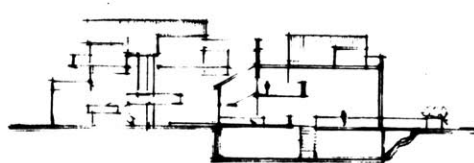
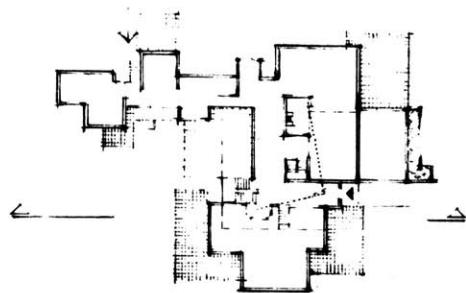
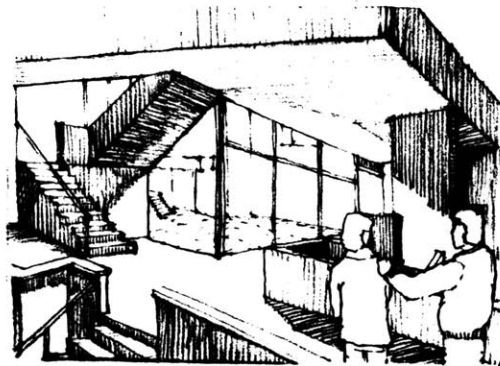
Expression of Function - Does the scheme express to inhabitants the function of various spaces both on the interior and on the exterior of the building?

Unity/Diversity - Does the scheme allow for the identification of individual territories within a common dwelling both on the interior and on the exterior of the building?

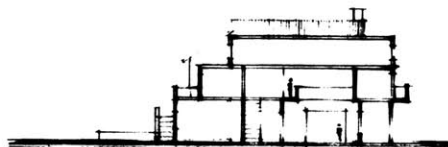
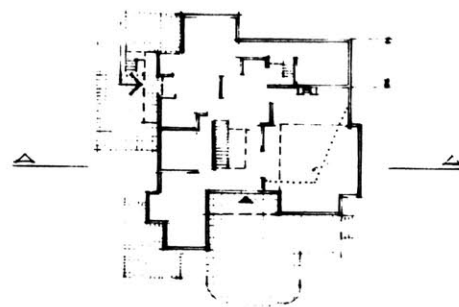
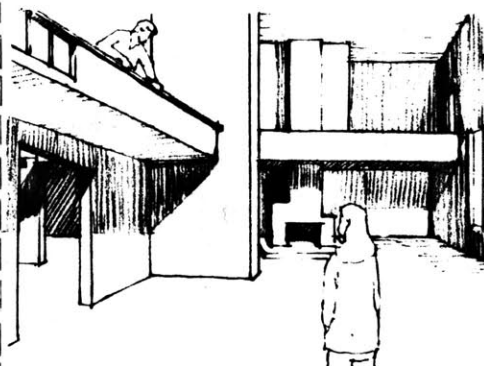
Memorable Image - Does the scheme present a coherent, appropriate, domestic image on the exterior?

	NEED						CONTEXT					FORM			
KEY : <input checked="" type="checkbox"/> superior <input type="checkbox"/> average <input type="checkbox"/> not addressed <input checked="" type="checkbox"/> poor	Accommodation of Functions	Communal Space	Privacies	Flexibility	Circulation	Exterior Space	Solar Orientation	Access	Scale	Views	Adjacent Buildings	Organization Clarity	Expression of Function	Unity	Memorable Image
	ALTERNATIVE														
	1	•	•	⊙	⊗	⊙	⊗	•	•	⊙	⊙	⊗	•	•	•
	2	⊙	•	⊙	•	⊙	•	•	•	•		⊙	⊗	⊗	
	3	•	⊙	⊙	•	⊙	•	•		⊙	⊗	•	⊙	•	⊙

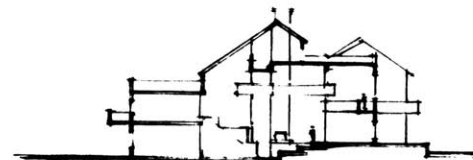
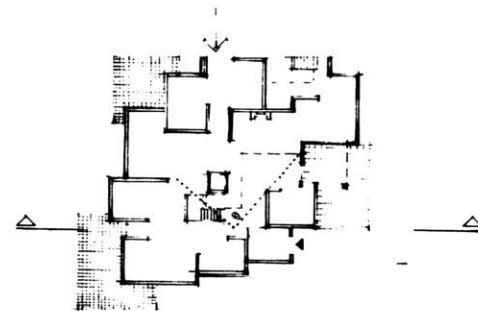
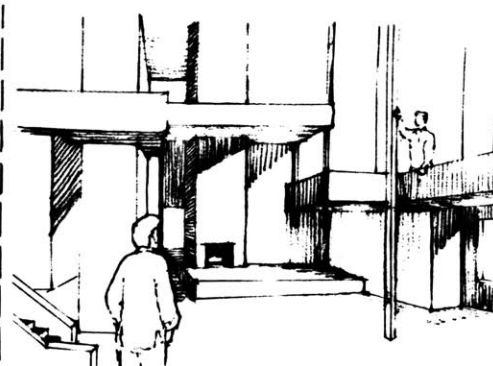
The chart above is used to compare evaluations of the alternative designs. It lists design criteria under the headings of need, context, and form. For each heading, the criteria are listed in order of importance, starting from the left (evaluation priorities). Each alternative is rated as providing a superior, average, or poor response to each criteria; blank spaces indicate no specific response. Thus the chart allows an overall view of the success of each alternative.



ALTERNATIVE 1



ALTERNATIVE 2

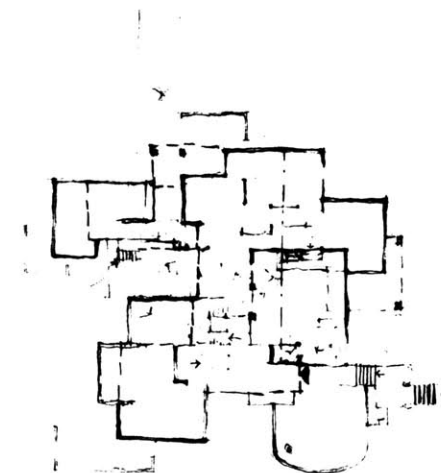
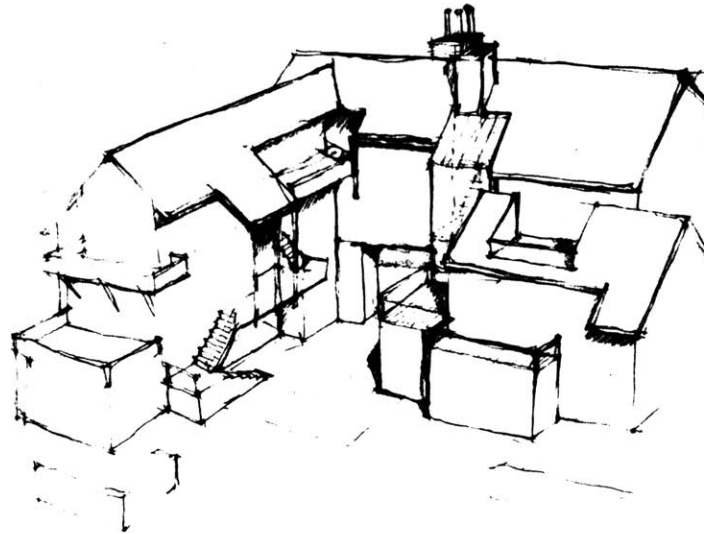


ALTERNATIVE 3

Consolidation

The evaluation process has generated a large amount of useful information in addition to pointing the way to a decision about alternatives. The purpose of consolidation is to try to incorporate as many good ideas as possible into the chosen scheme.

From the evaluation matrix one can see that Alternative 2 has addressed the largest number of high priority design criteria. It is clear, then, that the scheme should be loosely based upon Alternative 2 - with positive aspects of the other two alternatives making significant modifications.



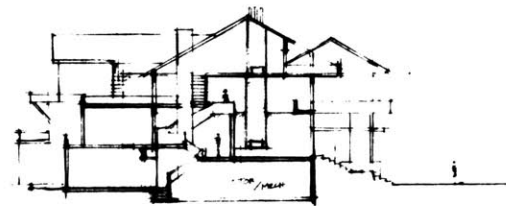
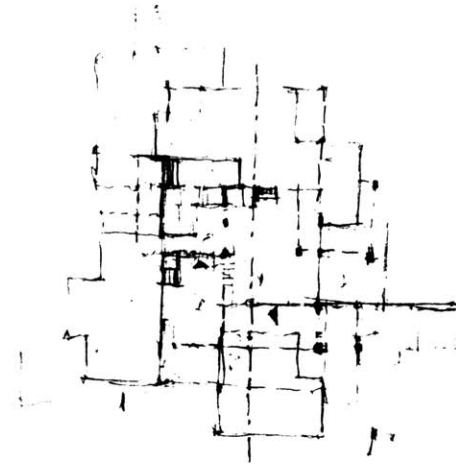
Description of Design

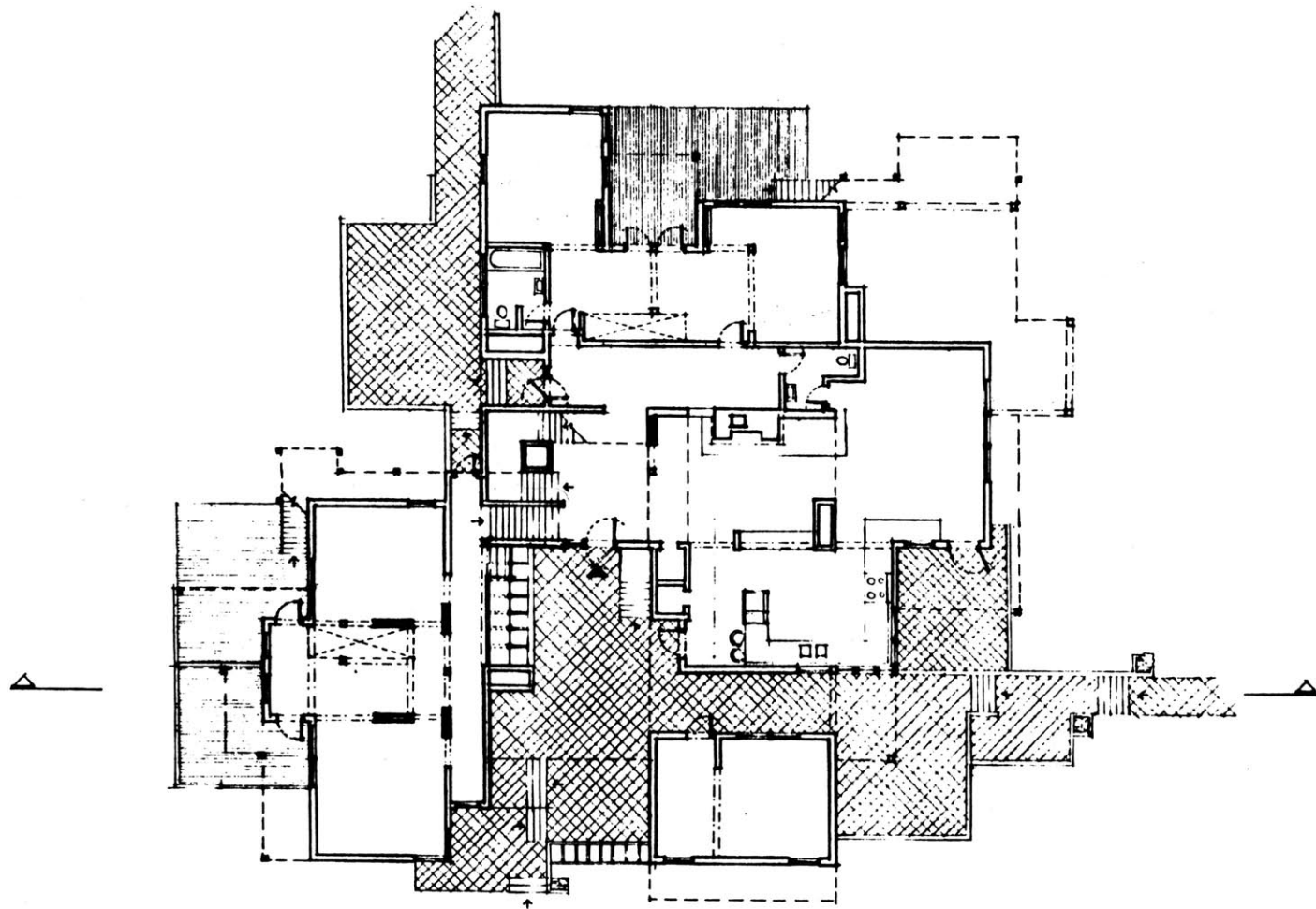
The building is essentially compact with an additional wing (at a slightly different level) surrounding a roofed, central exterior space. Entry is up some steps on the southeastern side of the building, under a "bridging" second story and into the central courtyard. Circulation inside the building is evident upon entry and emanates from the open, central stairway..

Parking is provided both on the east side and on the north side directly off the small road which rings the site. Storage is accommodated in a basement (under the courtyard) and more frequently used items can be stored in the small one-story structure

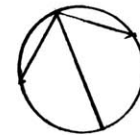
defining the entry in a corner of the courtyard.

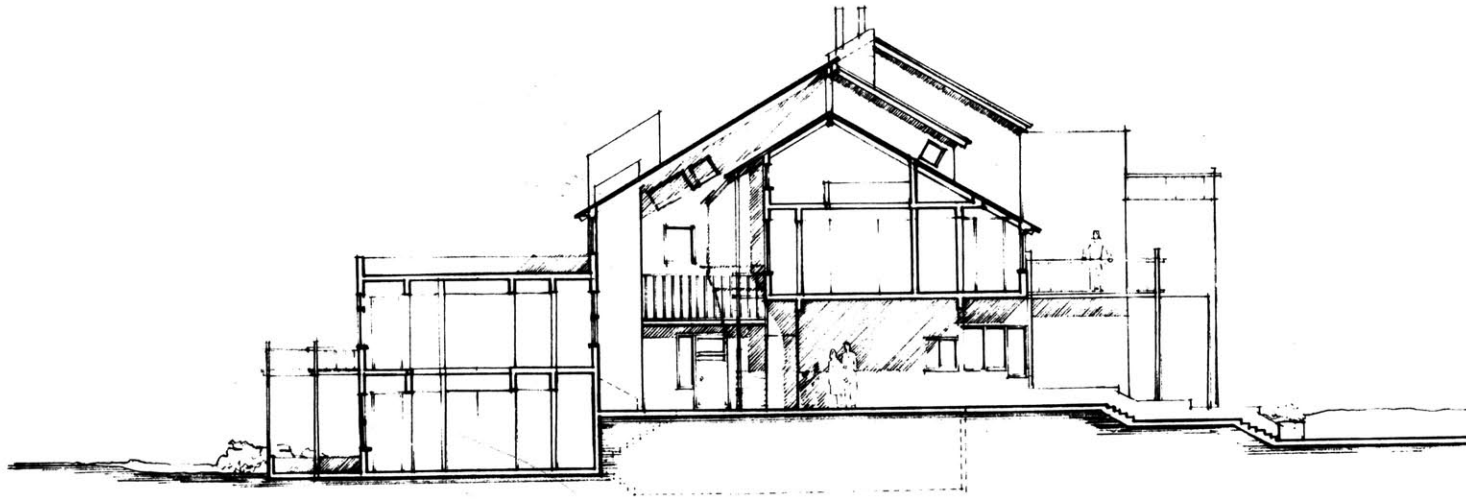
The building is approximately three and a half stories tall and is intended to have many of the external features of houses in the surrounding neighborhood (i.e. porches, pitched roofs, clapboard siding, etc.).



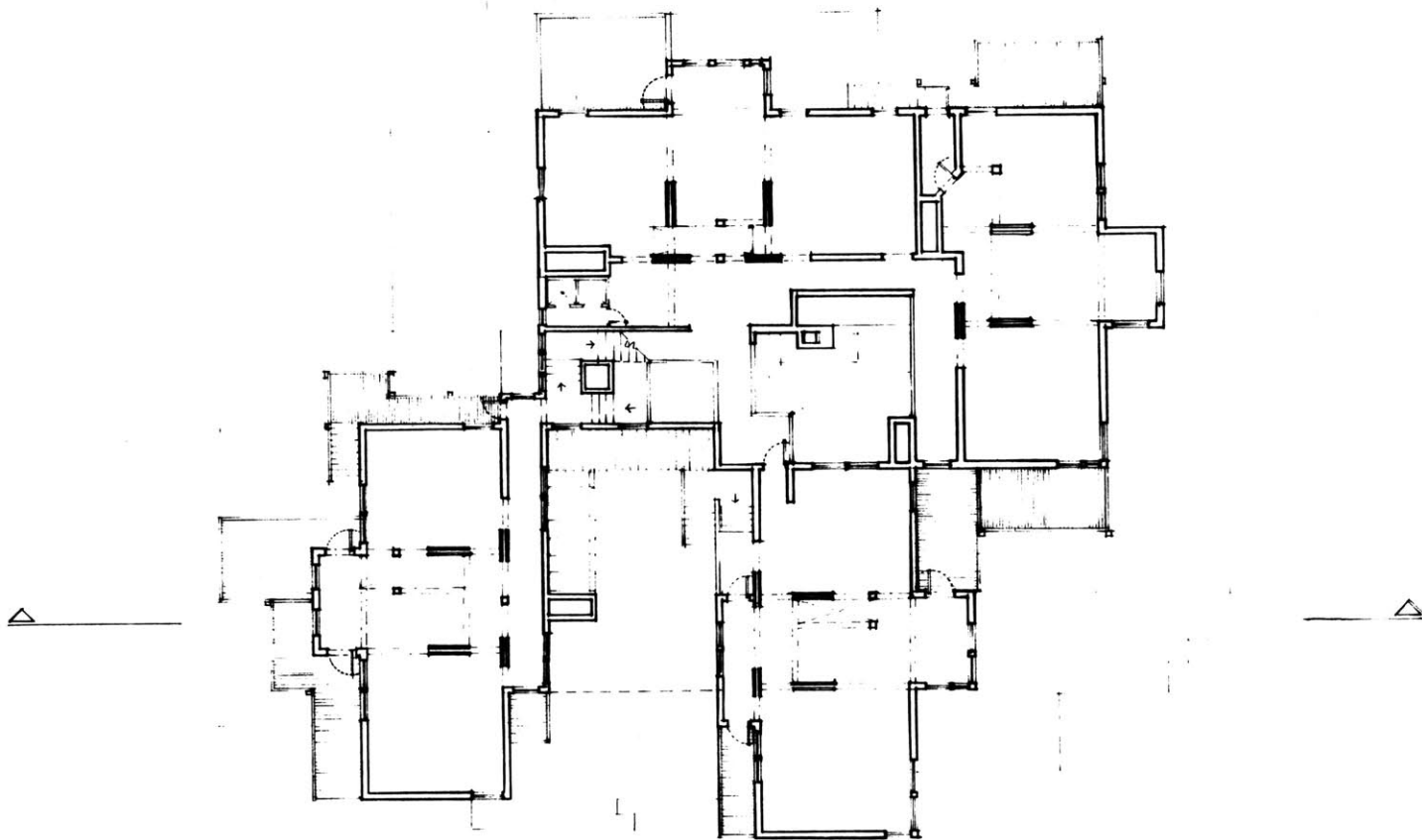


FIRST FLOOR PLAN

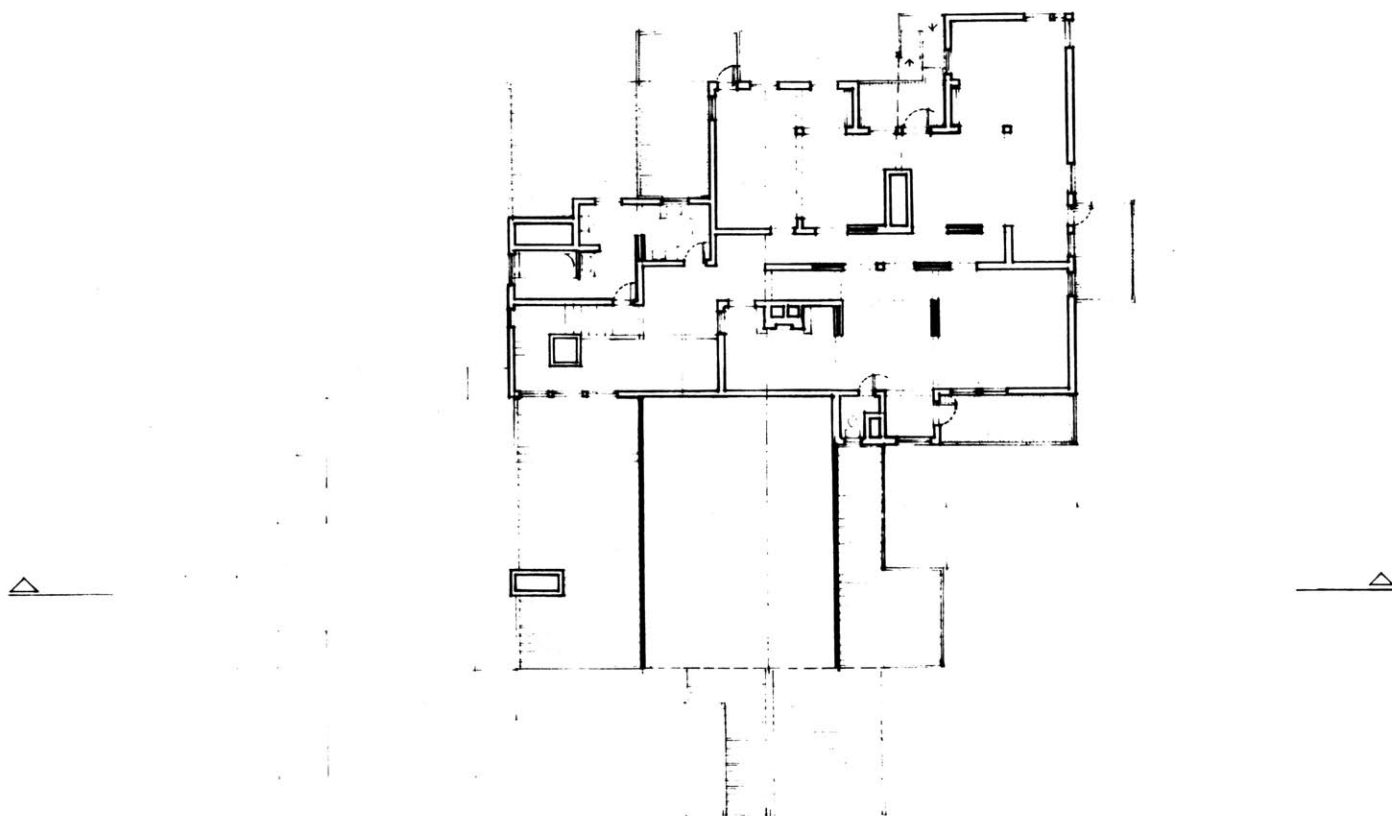




SECTION



SECOND FLOOR PLAN



THIRD FLOOR PLAN

Design of Private Territories

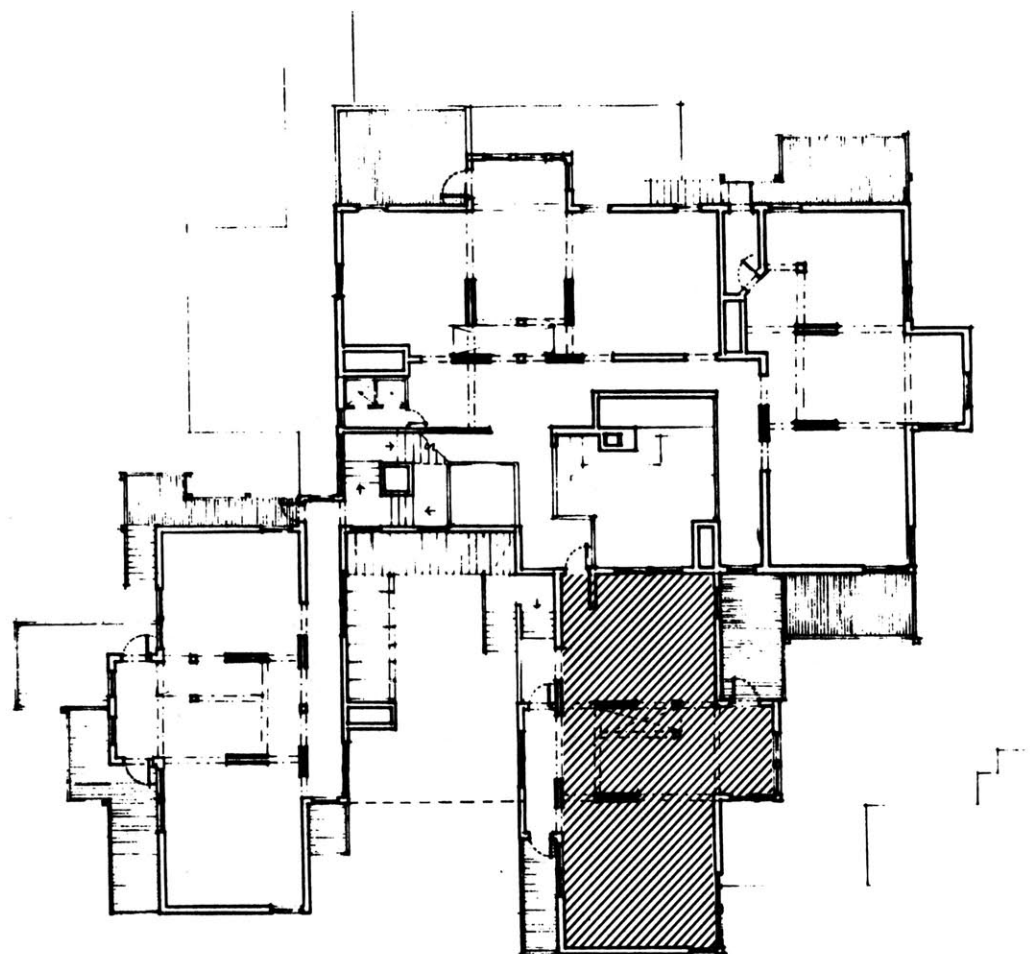
Private territories within the building were designed to be a repeating, identifiable configuration of elements with many options for subdivision and interpretations for use.

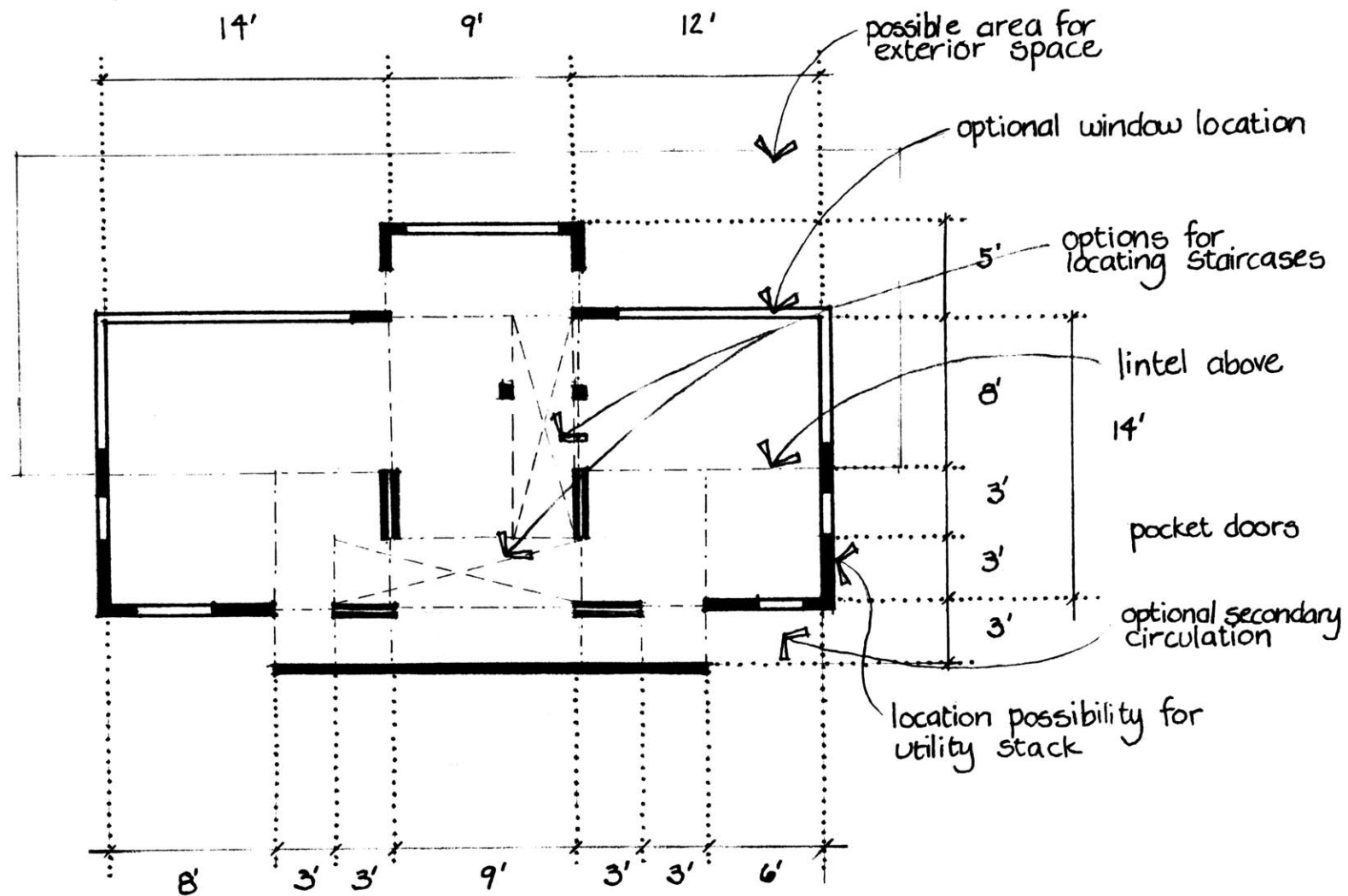
The repeated territory consists of three zones each of which alone is insufficient to be used as a private living space. Between these zones there are lintels and pocket doors which suggest but do not rigidly define possibilities for closure. Two locations for "pull-down" stairs are suggested in order to offer the option of combining spaces vertically into one private living space.

The possibility for secondary or internal circu-

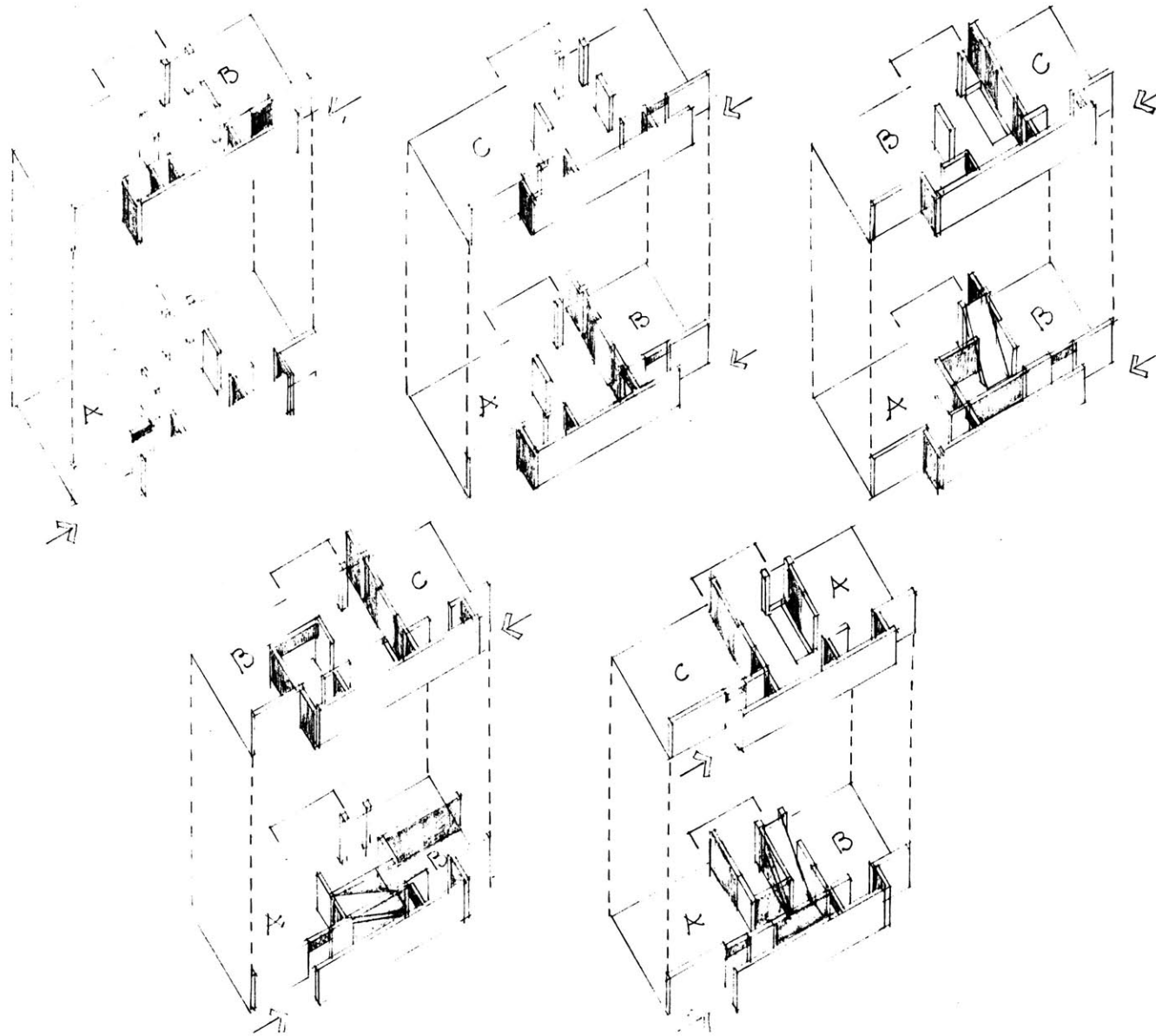
lation is provided by the placement of the "fixed" elements leaving a three foot zone clear within the private territory. Possibilities for connection to exterior space are also allowed by leaving space at the edge of the center zone.

A few of the many optional arrangements of spaces within these private territories are pictured. These are shown as an indication of the variety of configurations permitted with only minor additions of closure and use of the available devices (i.e. pocket doors, lintels, pull-down stairs, etc.).





total area = 535 sq.ft.



Testing

Inhabitations

In order to examine the preliminary design in terms of its flexibility and its possibilities for adaptation to fit a variety of modes of communal living, a test involving inhabitation of the floor plans was performed. Independent, unbiased help was sought to interpret the dwelling in the mode established by the prototypical groups studied through interviews.

NOTE:

Due to the scale of the drawings and the reduction necessary for proper presentation, the entire inhabitation of the dwelling is not included. Rather, an enlarged inhabitation of one

typical private territory is shown for each of the three styles of communal living tested. The author has tried to abstract the essential discoveries and complaints brought to the surface by each inhabitation.

Inclusive generality is tested by the range of interpretation that is possible through optional variations.

Maurice Smith

... a building must accommodate both individual and communal activities, purposes, and have the capacity over and above this to suggest these uses in different ways to each individual ...

*Herman
Hertzberger*

The Lessons Learned: Private Territories

From the exercise of inhabiting the private territories, several reoccurring needs and shortcomings of the design were pointed out. For all the options provided for, there were discovered a few more which must be accommodated in order to give occupants a full range of adaptation possibilities.

From the inhabitations, a clear theme of shared spaces and services (i.e. kitchens and bathrooms) were likely to occur in the central zone leaving the edge spaces (larger areas) for sleeping and private uses. However, this was not always the case. In the inhabitation of autonomous, apartment-like private territories, shared space

was often located at the end of circulation paths.

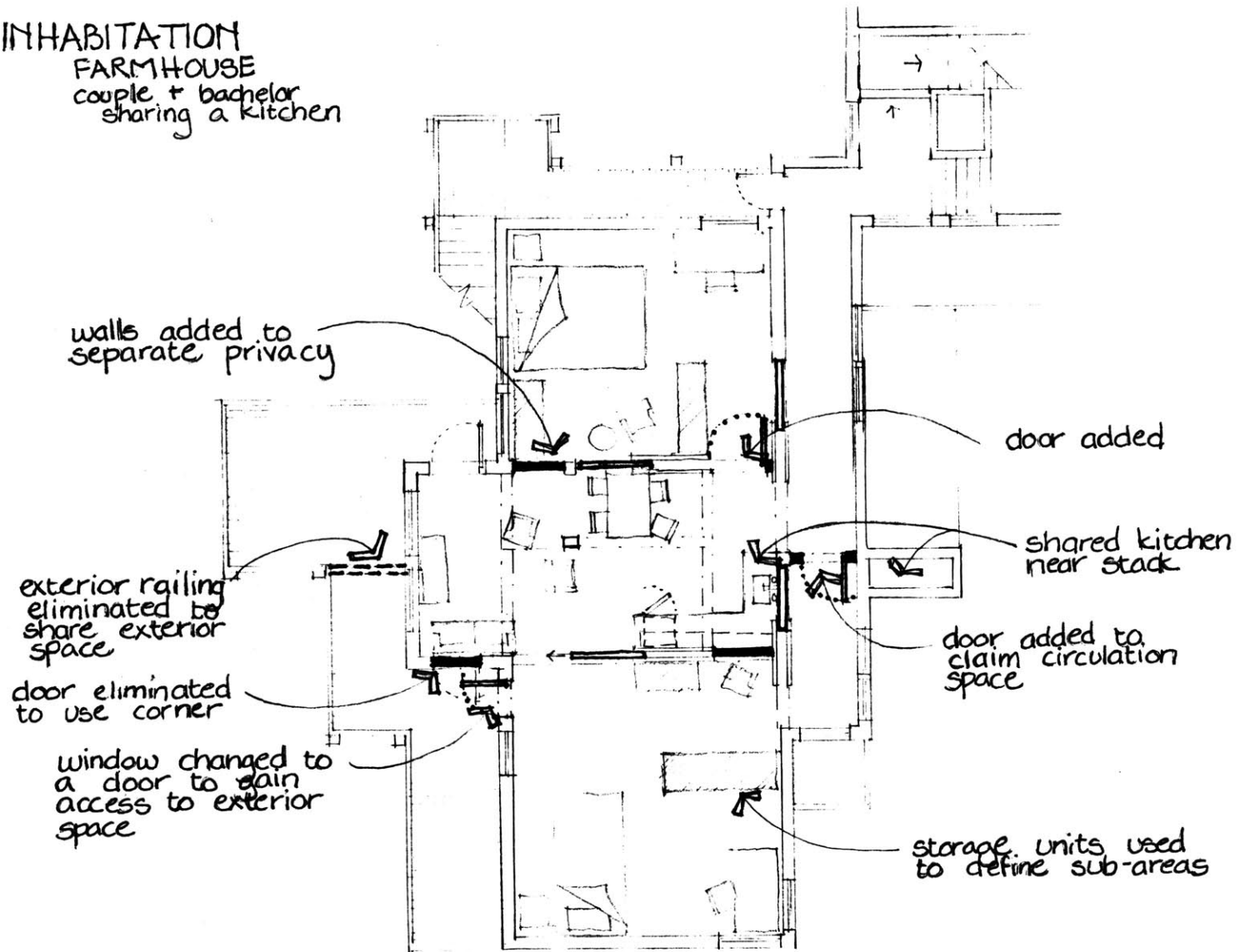
Since many of the larger spaces were used privately, a need for optional connections to exterior space from all interior spaces was seen as desirable. In many of the inhabited private territories, windows were changed to doors and doors provided in the central zone were blocked to create more "corners" for use in the shared spaces.

Another frequent issue was the option for inclusion of public circulation space (particularly at the ends of circulation) to be part of the private territories or to be used for common facilities such as bathrooms and

storage. Because the private territories were proposed as a generic, out-of-context design solution, many possibilities allowed by their specific location in the building were not exploited.

The center zone of the private territory seemed to need more careful attention. Kitchens and bathrooms were most often located there, indicating a need for location of a utility stack somewhere within the center zone. The stair possibilities were sometimes deemed inappropriate for the central zone since much space was wasted in circulation above.

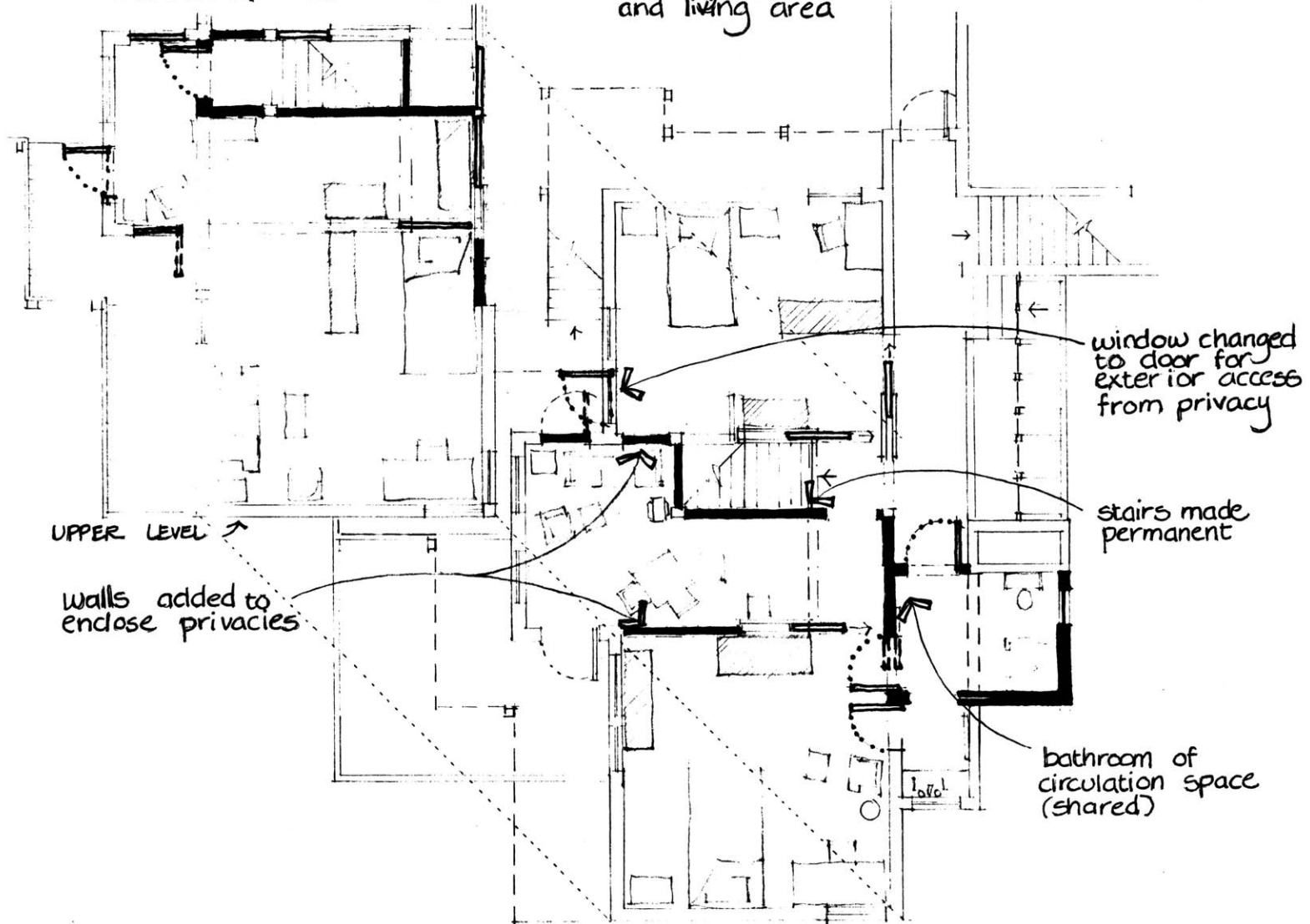
INHABITATION
FARMHOUSE
couple + bachelor
sharing a kitchen



INHABITATION

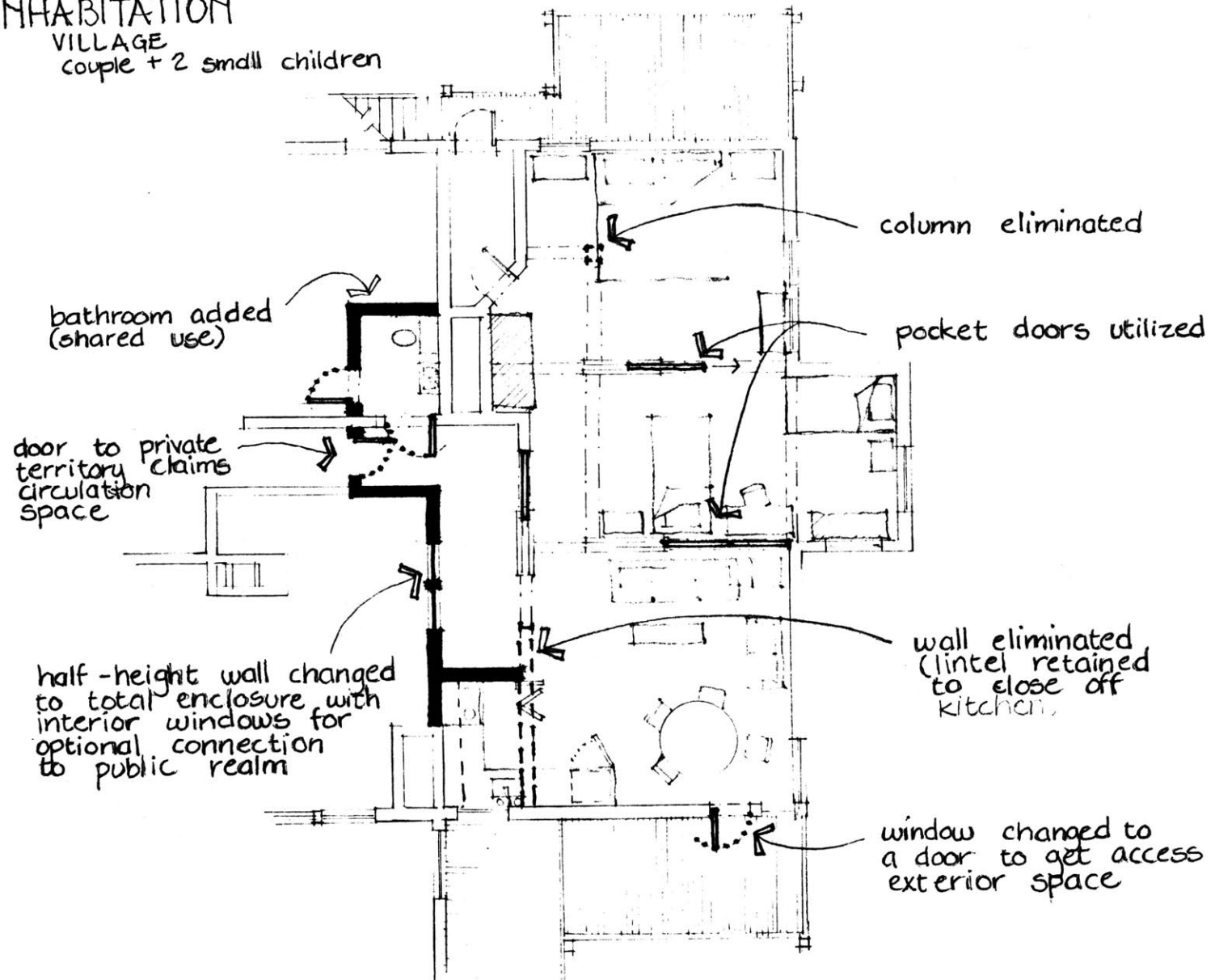
BOARDINGHOUSE

3 bachelors sharing a bathroom
and living area



INHABITATION

VILLAGE
couple + 2 small children



Suggested Revisions: Private Territories

The problems highlighted by the inhabitations are significant and warrant more thought and revision of the preliminary design ideas. The private territories in particular need new proposals for dealing with issues such as stair location possibilities and utility stack proximity.

Two types of revisions are proposed. The first increases square footage considerably, provides for optional stairways at the corners of the private territory, and uses the center zone as a location for a "wet wall" with folding walls which offer many possibilities for bathroom or small kitchens within the private territory.

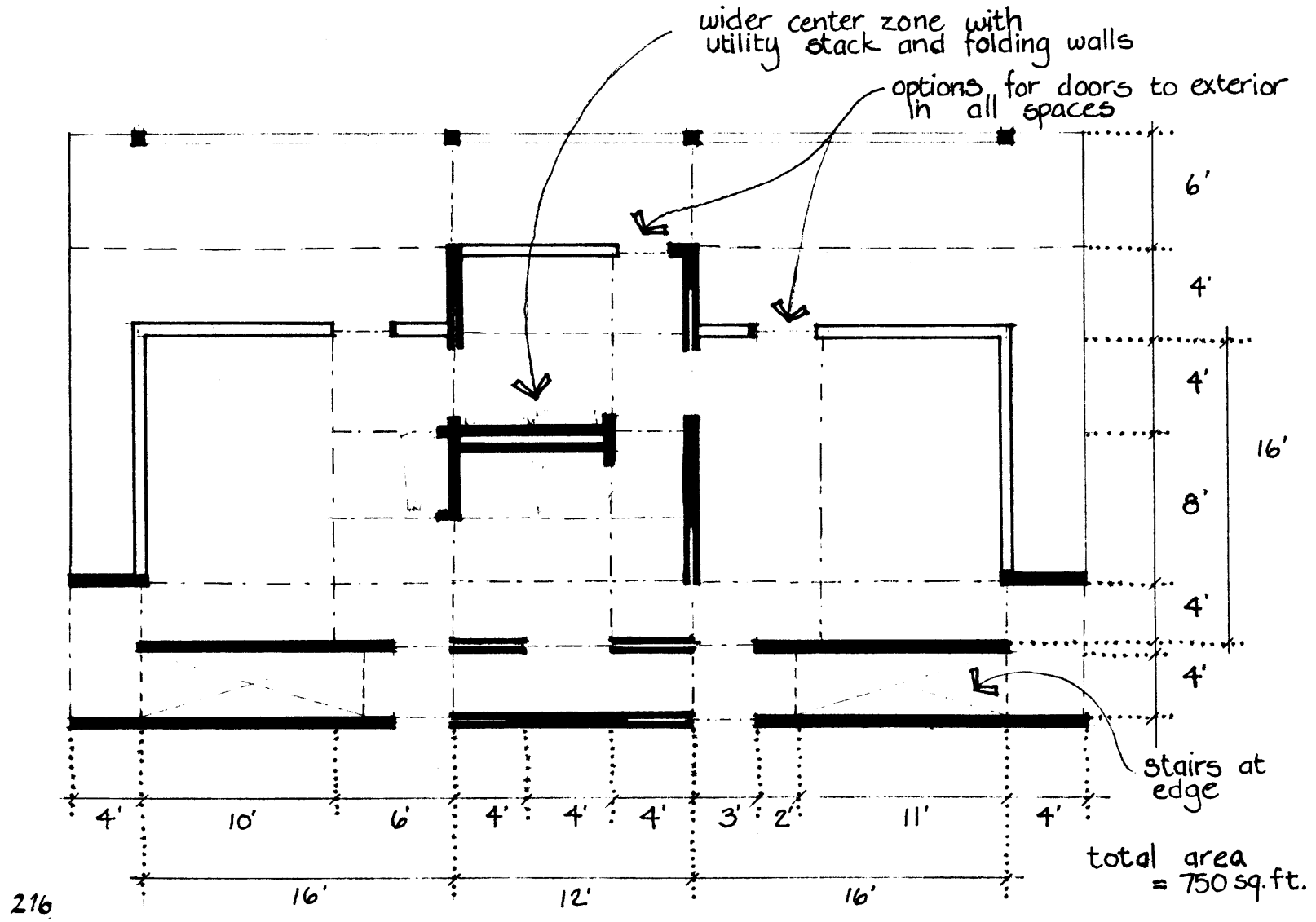
The second revision also increases square footage by providing an extra zone outside of the private space for the possible location of serviced areas such as bathrooms and small kitchens. The reasoning behind peripherally (but symmetrically) locating utility stacks is to allow back-to-back placement of private territories which might share one utility stack. The center zone of the private territory is also left free for circulation and possible stair location.

In both of these suggested revisions, doors to the exterior space have been relocated to maximize the use of those spaces. In both

revisions, more clues for expansion possibilities are provided. Columns, low walls, and overhangs have been added to suggest opportunity for extending into private exterior space.

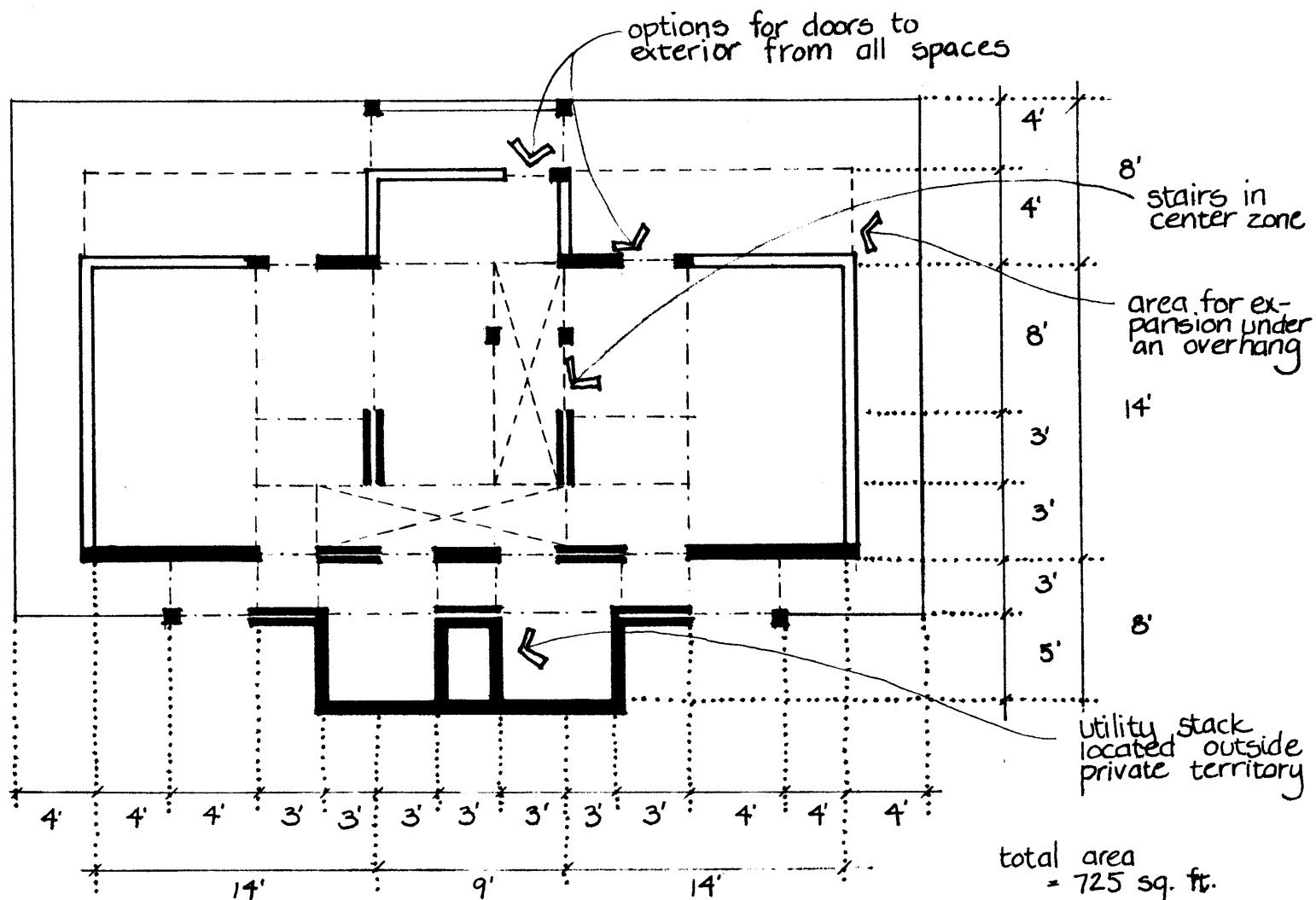
REVISION

PRIVATE TERRITORY 1



REVISION

PRIVATE TERRITORY 2



The Lessons Learned: Common Spaces

The common spaces of the dwelling were also tested through inhabitation. Some issues discovered seem common to all modes of communal life-style.

In general, more space was deemed necessary. The living area in particular was thought too small. Because there was only one such common space it tended to be divided into smaller areas to provide opportunities for choice. The space was also seen as too open to circulation and public view. Various attempts were made to block off circulation and create some "cozy" areas within the small space. Some more intimate common living spaces were provided on upper

levels but were not seen as a substitute for the first floor common gathering space.

The common kitchen was also thought to be minimal. A bigger pantry and more "in-kitchen" eating space seemed necessary. Also the stove and refrigerator locations were switched to give easier refrigerator access from the dining area.

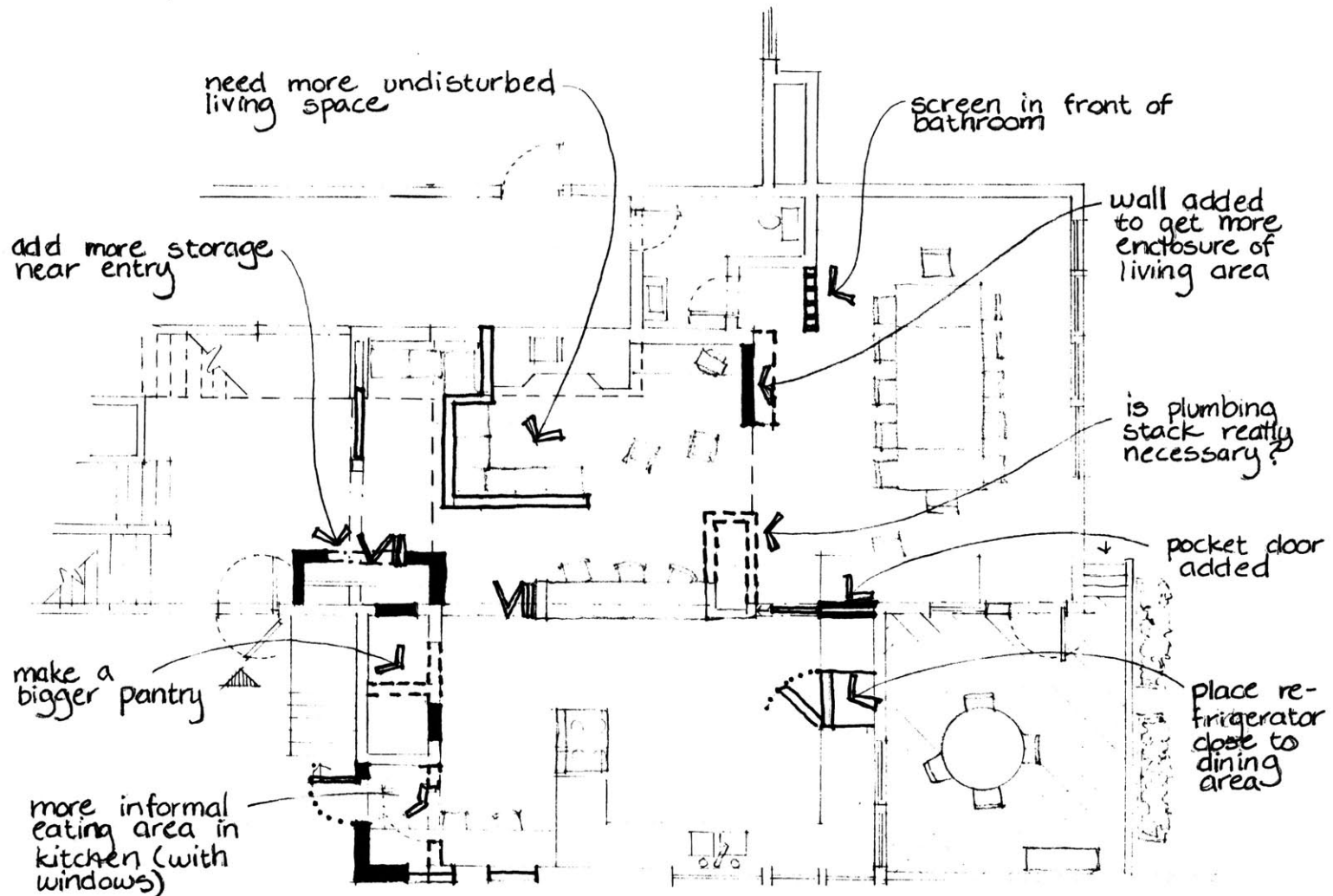
More storage was commonly added to the entry area and some type of screening of the entry from the kitchen and living spaces was proposed.

The central location of the utility stack was questioned with regard to its limitations on flexibility. The small bathroom (both its

location and its necessity) was also questioned.

INHABITATION

COMMON SPACES



Suggested Revisions : Common Spaces

Because the common spaces of this dwelling are peculiar to this floor plan and building organization, many problems brought to the surface by the inhabitations cannot be solved without serious re-thinking of the entire design. However, the organization of the building was selected through proper evaluation of many alternatives and the basic layout of public and private spaces ought to remain the same.

Circulation may be somewhat altered, however, to solve the problem of a heavily trafficked living area. More living space is also provided to give more options for communal activities.

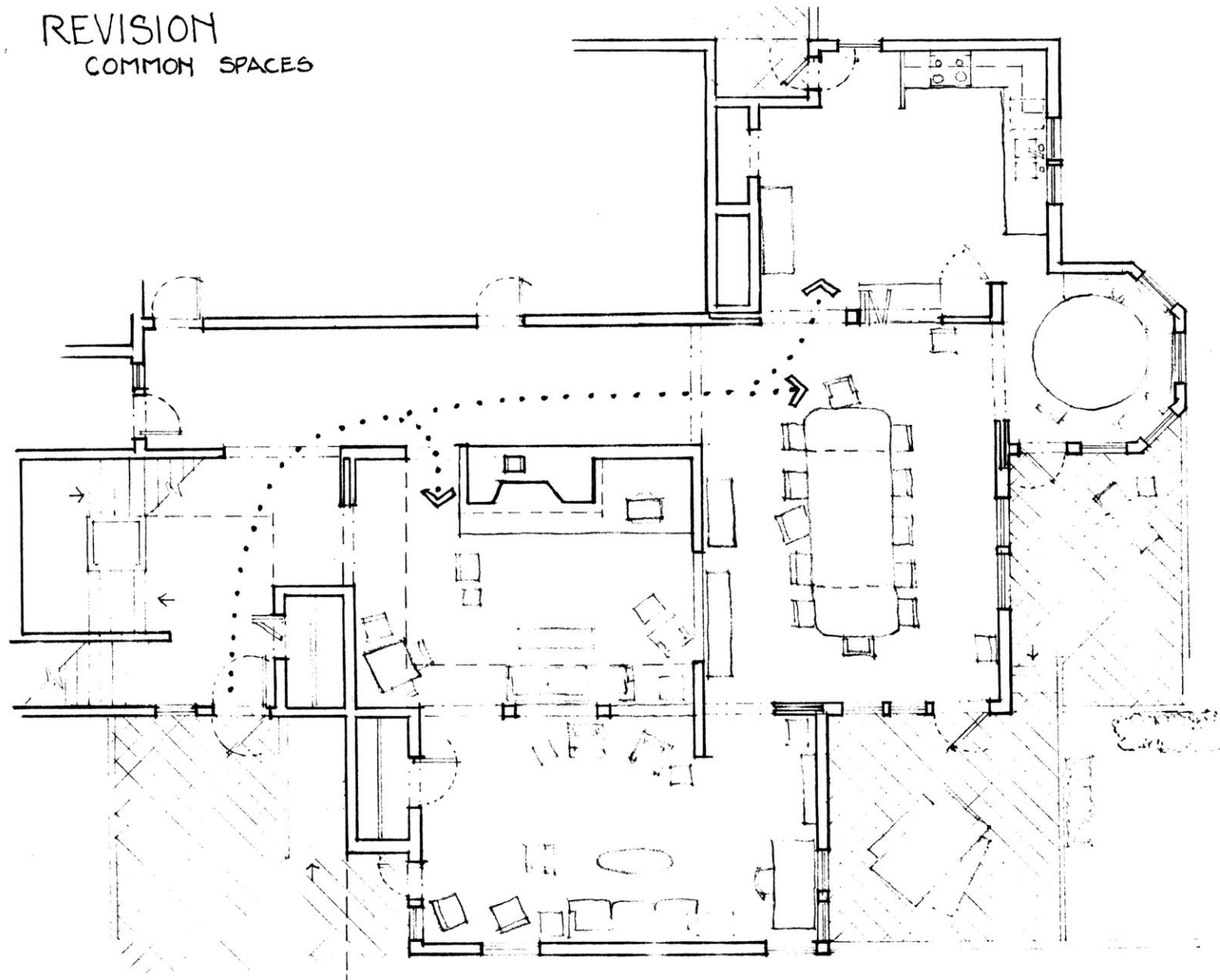
The kitchen is re-located

in order to remove it from view from the entry and to provide it with more nearby, informal eating space and a service entry apart from the public entry.

The small half bath and the central utility stack are eliminated and a coat closet serves the storage needs upon entry and blocks views into living spaces.

The square footage of the communal space is slightly increased and a more efficient layout is achieved.

REVISION
COMMON SPACES



NOTE:

The work presented up to this point has focused on understanding and development of programmatic issues involved in shared living environments and an attempt to test out such issues in a designed example. This work has led the author to an understanding through which some projections and recommendations about strictly physical design issues can be attempted. It is realized that the following section only hints at some important issues. To thoroughly address these issues might be the topic of another lengthy study. The author feels it important to at least get the reader started on the train of thinking in terms of physical form-making that the preceding research and thought brings up.

Projections

A "Footprint" for Private Territories

In drawing some useful conclusions from this work, perhaps the most generally helpful thought has been in specifying guidelines for the dimensioning and positioning of private territories within a shared dwelling. The approach was to develop one possible configuration which could optimize choices for uses and be used as a "deployable" element or "footprint" in a variety of ways to define a shared living environment.

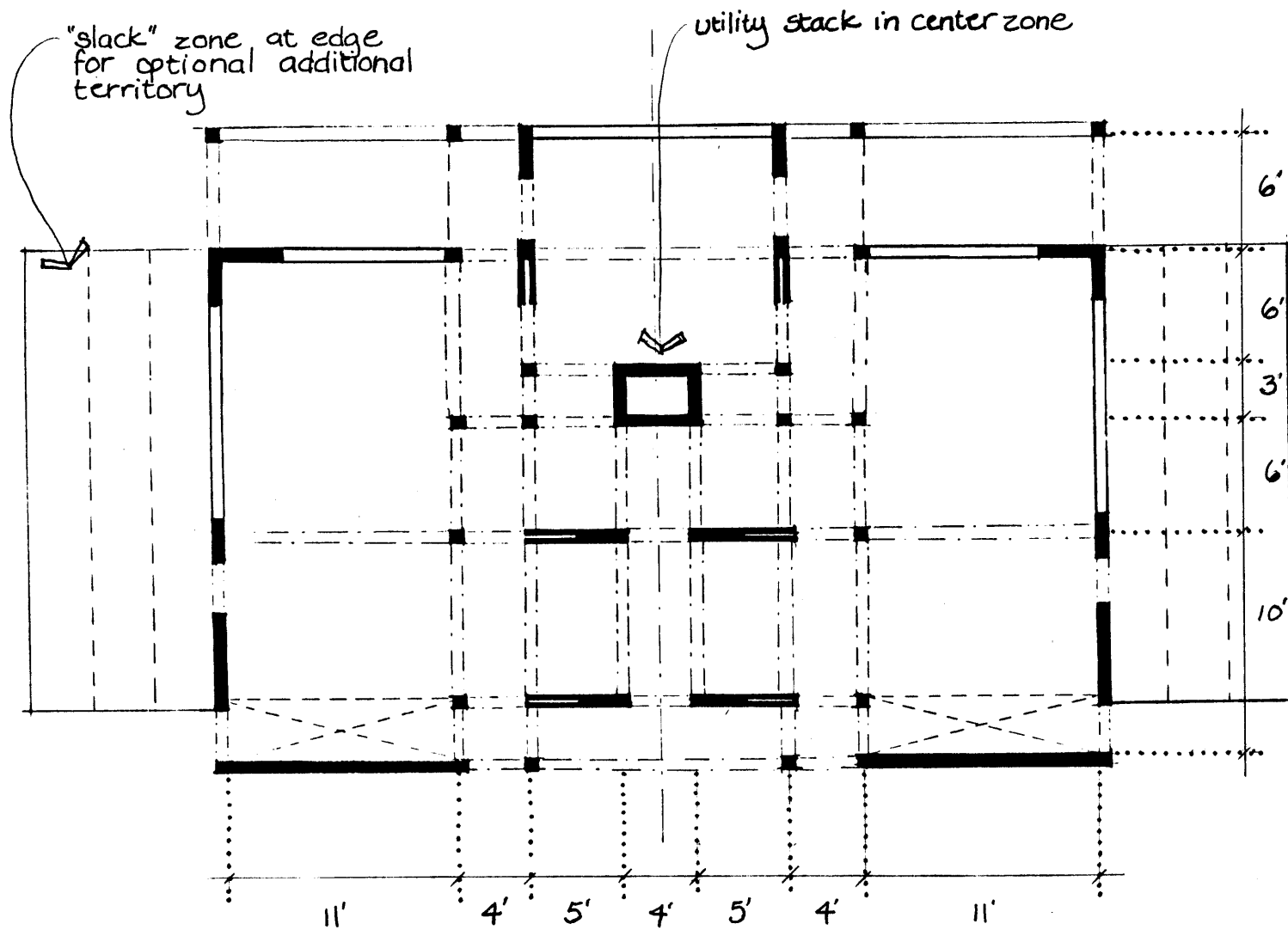
"Footprint" is a term used here to connote an unchangeable, identifiable, repeating configuration of fixed elements which define spaces. The basic footprint is not static, however, as it can

be flipped, used in a variety of orientations with respect to the rest of the building, concatenated to other similar footprints, and, of course, allow for many internal partitioning choices. The term "footprint" is meant to refer to the basic "framework" or structured organization of a private territory.

From the revision attempts, many issues were raised concerning utility stack and stair location possibilities. Optimizing the number of locations that could have wet services by placing a utility stack symmetrically in the center zone seemed a reasonable way to allow many convenient layouts of functions. Also

because stairs do not work well in the same area as utility runs, the location of vertical circulation is more strategic on the inner edges of private territories. This also offers the option of the stairs belonging to a private territory above as well as the option of the stairs being used as a private vertical connection internal to an individual's space. Only the location of the door would have to be changed to offer this possibility. The possibility of entirely eliminating public circulation from upper floors is open if private stairways are used to access upper level private territories from the floor below.

FOOTPRINT



... would make early decisions that supplied the first round of definition. These would be definite enough to support subsequent actions, but not so powerfully hierarchic as to eliminate the particular attributes of even later contributions. Each decision-making process should not be totally complete; it welcomes the next round.

Maurice Smith

NOTE:

It is not the intention of the author to contend that the private territory "footprint" developed here is the "optimal" or "ideal" space within a congregate dwelling. A good deal of thought has gone into the generic issues which help or hinder adaptive possibilities, however.

The activities allowed within such private territories are limited due to the underlying understanding that the occupants of the territories are residents of a shared dwelling and therefore have access to some shared facilities. The private territory then cannot and should not attempt to accommodate all activities

(i.e. it is not a complete dwelling in and of itself). The possibility exists, however, for the entire territory to be used as an individual living realm in the mode of an autonomous, mini-apartment within the shared environment (see minimal inhabitation). The minimum spatial envelope is perhaps of most concern in attempting to understand the maximum program options that need to be accommodated within the private territory (see maximum inhabitation).

At its maximum capacity a private territory should accomodate:

- 2 sleeping places
- 2 "living" (or lounging, studying, eating) places
- 2 half baths with showers or 1 shared full bathroom
- circulation space
- 2 stair options

Kitchens are considered to be only marginally essential since every communal dwelling is likely to have a common kitchen. Bathrooms, on the other hand, are symbols of the ultimate privacy and are much appreciated by inhabitants of congregate dwellings. Because of this association of privacy, it is important that occupants are not forced to share this

facility with others.

The many options for arrangement of these activity settings are provided by indication of possible partition locations (i.e. columns and lintels overhead). This "footprint" has more potential than can be shown. Obviously some adjacencies of activities cannot be accomodated by this particular configuration, but the possibilities that do exist are quite numerous and considerably more varied than those offered by traditional apartment layouts.

The "footprint" is actually only a suggestion for dimensioning and placement of fixed elements. Many of the edges could be altered (expanded or contracted) and much of the so-called "arch-

itectural" decisions concerning materials, detailing, window heights, etc. can have multiple interpretations and still fit into the general idea of the "footprint". Such variations from the basic or generic design provide personalization possibilities, a way to respond to local context conditions, and an open forum for architectural expression.

One of the important aspects of the idea of the "footprint" is the notion that it is a repeatable, recognizable piece of the building. This hints at a type of modular approach to congruent housing (that is, the residents may be able to conceive of expanding their household size by simply adding another private territory

or two). But more importantly, the repeating piece can be arranged in many ways to suite many different densities and types of context. They may appear strung loosely together (as in the design example presented) in a low-density, suburban situation, or placed together in a linear way on a long-narrow site, or focused around a common view.

that a deployable element can be developed which could make construction simpler and organization clearer without sacrificing adaptability, multiple interpretation possibilities, or functionality.

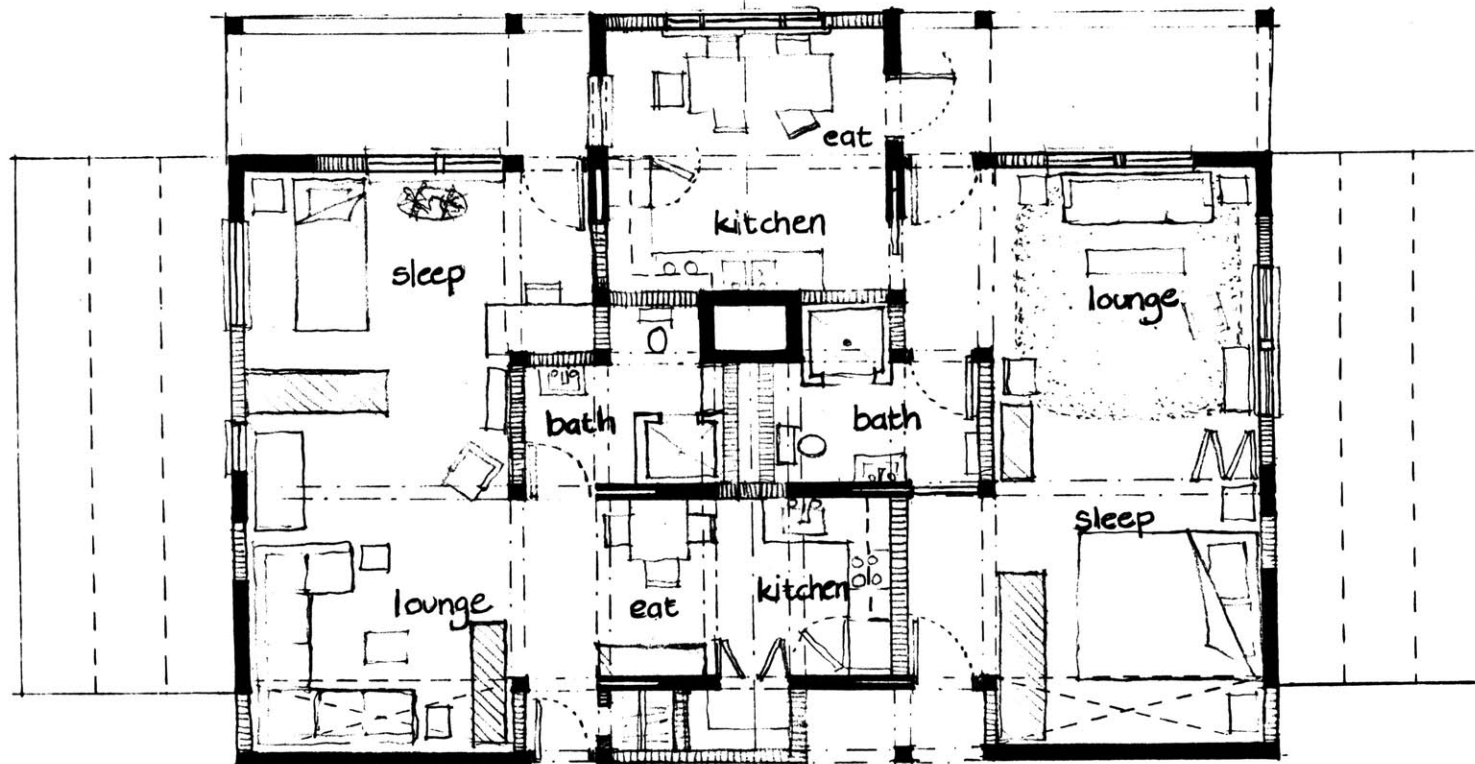
NOTE:

This particular configuration of spaces was developed in the context of a single-family house prototype (see section on Housing Type and Image). Its appropriateness in a rowhouse situation, for instance, is therefore suspect. The point is, however, to show

MAXIMAL INHABITATION

within minimal private territory

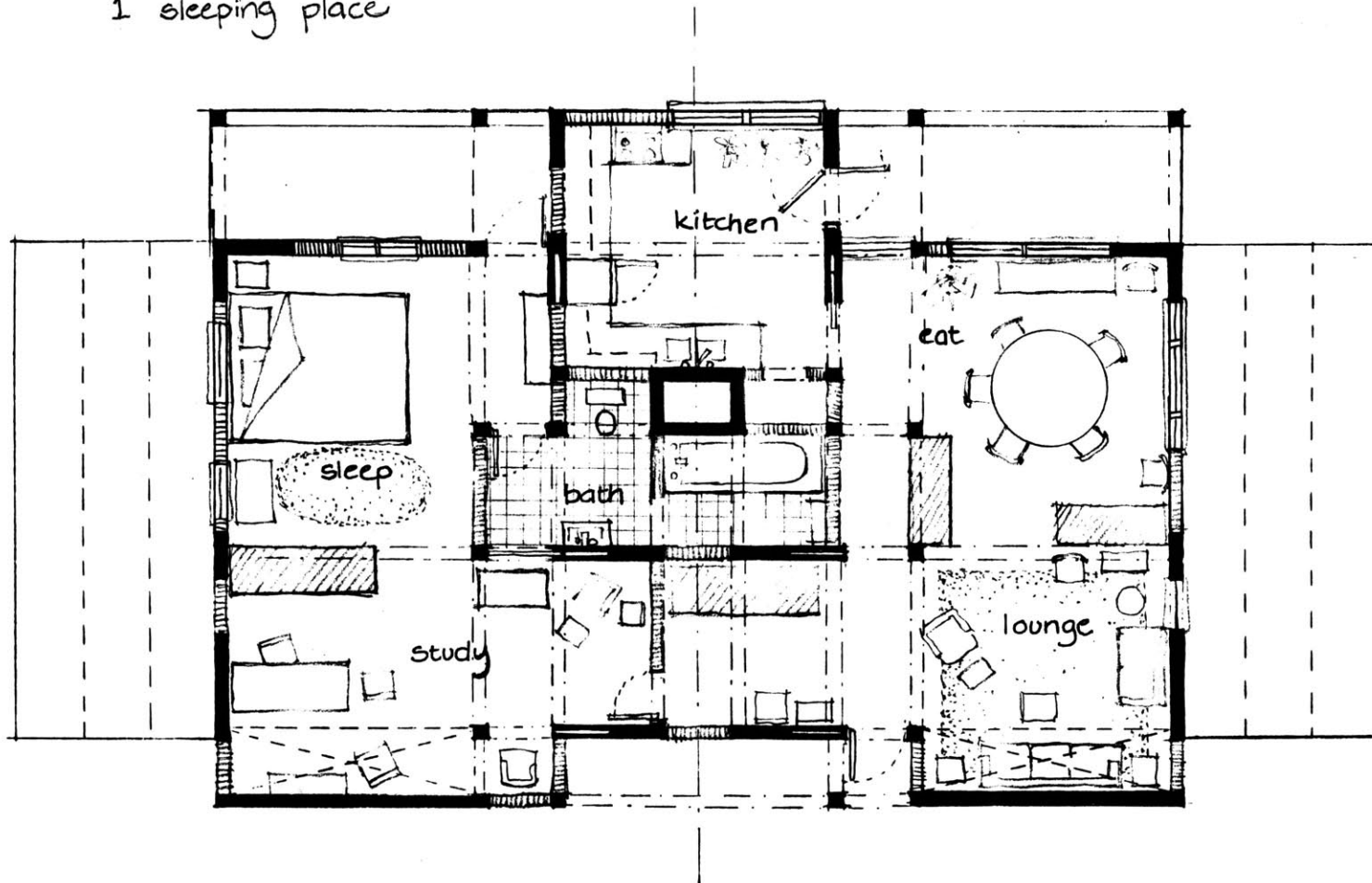
- 2 sleeping places
- 2 lounges
- 2 kitchens
- 2 bathrooms (with showers)



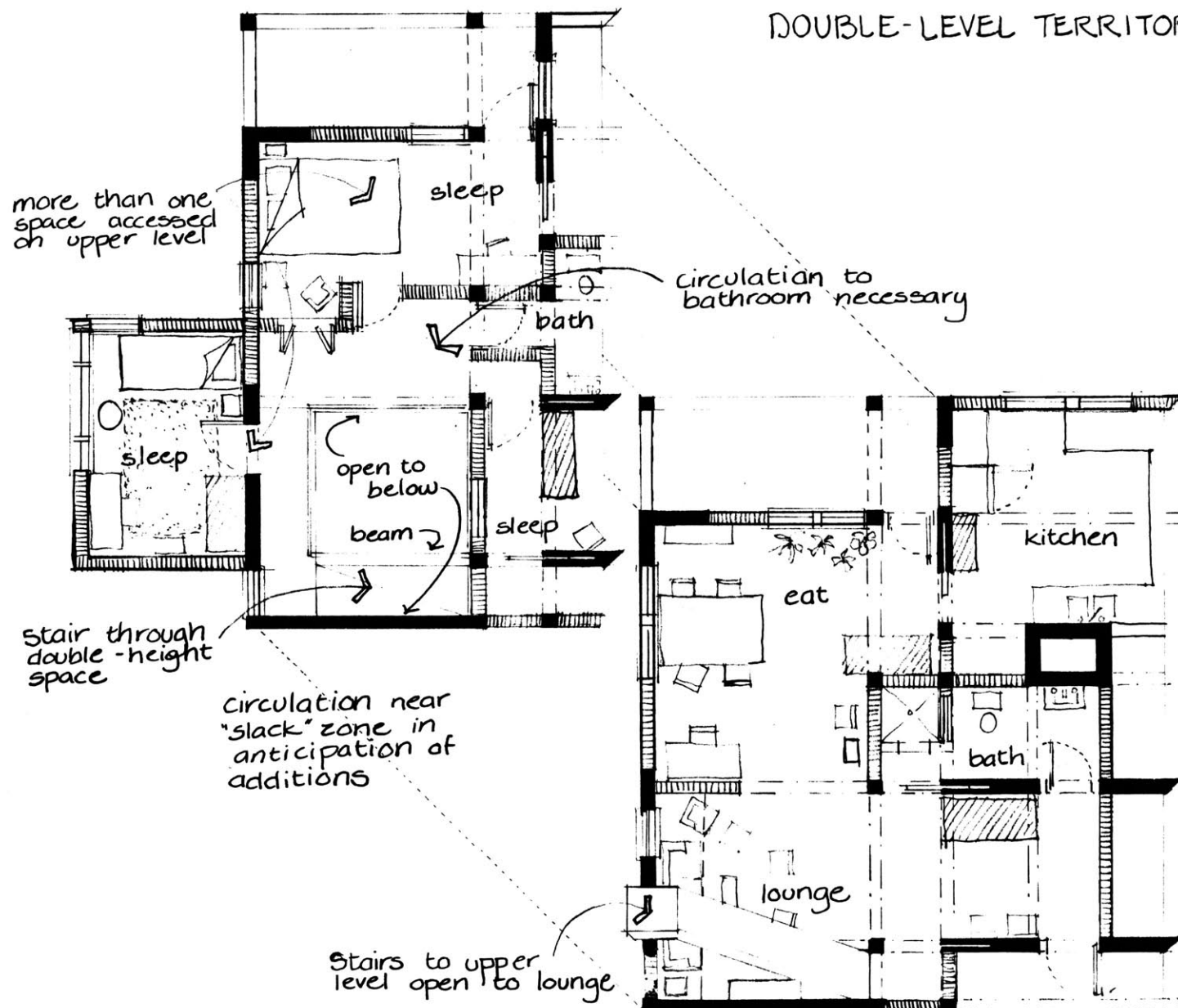
MINIMAL INHABITATION

within minimal private territory

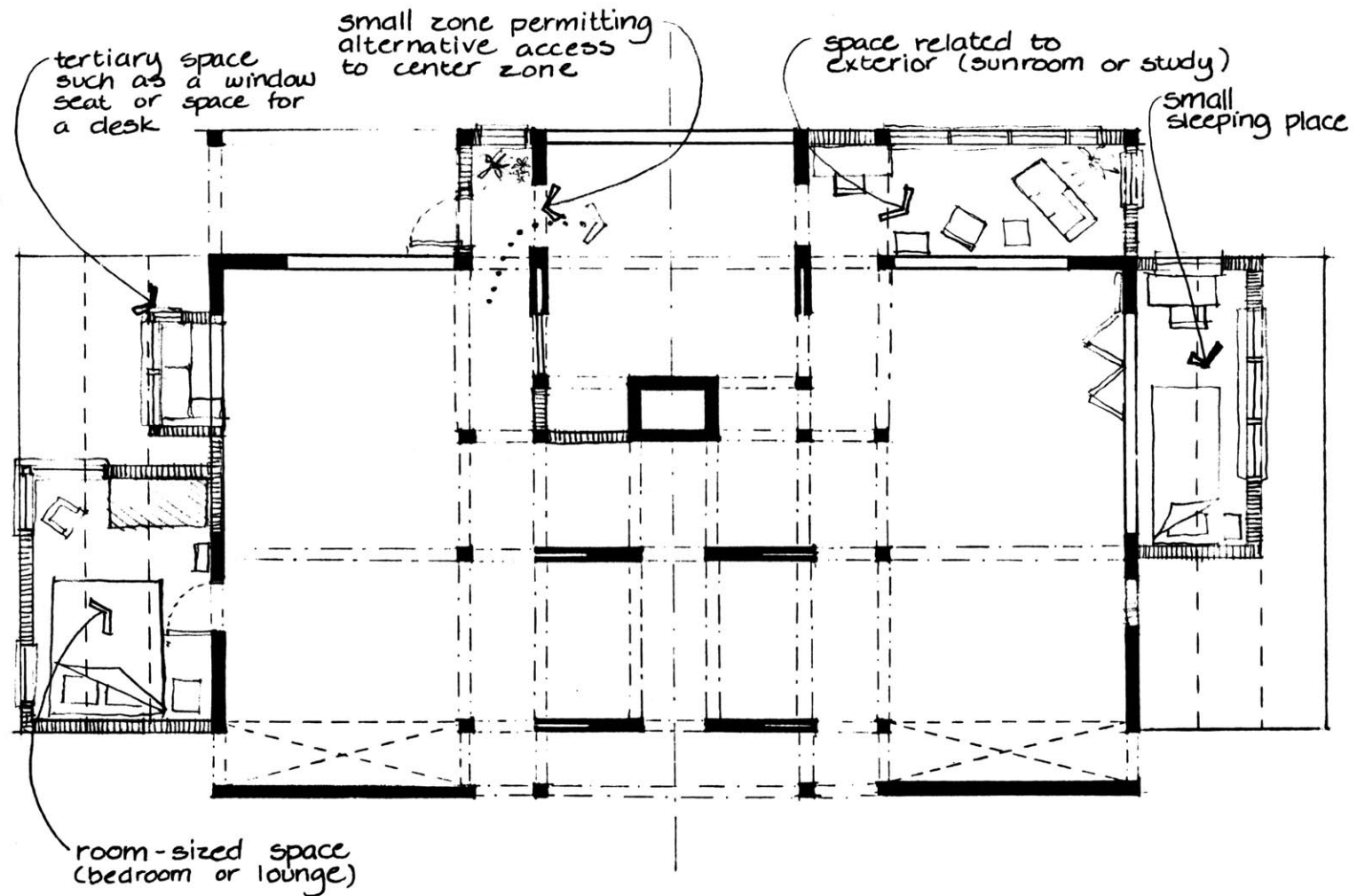
- 1 kitchen
- 1 bathroom (full)
- 1 sleeping place



DOUBLE-LEVEL TERRITORY



EXPANSION POSSIBILITIES



Summary

Summary

The aim of this thesis has been to point out that architecture can and should provide a means for allowing the option of communal living. The available physical elements and the current social atmosphere do allow for some people to make a shared lifestyle a workable alternative today but an awareness and a responsive attitude on the part of design professionals could make more choices for more housing consumers and could make the concept of congregate living a truly viable alternative lifestyle.

This thesis is really a demonstrated argument in opposition to those designers who are of the opinion that the traditional single family,

individually owned, non-flexible, living environment is culturally imbedded and economically wedded to the American way of life. It is an argument in favor of maximizing the possibilities for choice by individuals (a principle linked to the American ideal of "the pursuit of happiness").

The architect's role in providing means to achieve this ideal may be in the form of experimentation with new ways of conceiving desirable lifestyle options or in making new adaptable "footprints" which encourage occupants to get involved in the on-going process of design. This sort of ingenuity and creativity is necessary and will

help to bridge the technology gap. As the design profession and society start re-examining set methods and assumptions about user preferences and as users begin to demand more of their living environments, the product market will respond with more devices which facilitate change and offer more choices; witness the growing popularity of the "do-it-yourself" movement and the changes in the furniture and equipment industries toward modularity and extendable storage systems.

The thesis has attempted to outline some of the background and precedents for the ideas of congregate living and adaptable/flexible

architecture. Beyond this, a cursory look at real-world, existing examples was made in order to abstract problems of shared living and to generate guidelines and patterns to be used in an experimental way in trying to solve some of the problems discovered. A design (which the reader is reminded to keep in the perspective of an example) was then put forward and tested.

In developing this particular design scheme, some generalizeable conclusions were reached concerning the requirements for private territories within shared dwellings. A basic unit was proposed which could be multiply interpreted, arranged within a building in a variety of ways (responding to a variety of building types and

contexts), and accomodate many of the more important variations of program and architectural form. This "footprint" or "support" for private territories was presented, not as a "perfect" or "generic" solution, but as a point of departure for thinking about and designing for tractable, shared environments.

By way of concluding this work, a suggestion of its general applicability and potentials outside of its own confines should be stated. The work has broader uses which could extend to the design of congregate dwellings for the elderly, half-way houses, hostels, correction facilities for delinquent youths, hospices, and dormitories, as examples. Some of

the issues discussed are common to almost all situations in which groups of people share in the use of built environments.

This work exposes only the tip of the proverbial iceberg of shared living issues and options.

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